THE MIND OF MAN

No eye could be too sound
  To observe a world so vast;
No patience too profound
  To sort what's here amassed.—*Matthew Arnold.*

Between the muscle-nerve preparation at the one limit, and our conscious willing selves at the other, there is a continuous gradation without a break; we cannot fix any linear barrier in the brain or in the general nervous system, and say "beyond this there is volition and intelligence, but up to this there is none."—*Michael Foster.*

THE MIND OF MAN

A TEXT-BOOK OF PSYCHOLOGY

BY

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PREFACE

WHAT more interesting study can there be than that of the Mind of Man? Tennyson wrote enthusiastically of "the fairy tales of science," having in view only the results of physical research, and yet, manifestly, the exploration of the realm of mind must yield information which is no less fascinating. To observe the mind at work—thinking, or imagining, or feeling, or dreaming—must assuredly rival what is given by geology or by astronomy.

The scientific study of mind, however, is not only interesting; it has far-reaching consequences. The principles of education and those of morals and aesthetics are closely bound up with it, while even such sciences as political economy and sociology are likely to be transformed through its influence.

Furthermore, a science of mind must revolutionise the whole of philosophy. By determining the nature of mental process and the nature of mind, it will set at rest once for all those discussions which have raged around a unitary conception of the universe. Physical science and mental science will then no more form two independent and hostile camps, and speculative metaphysics will cease to exist, handing over its many interesting problems to science.

If psychology cannot as yet boast of any great truths, that is because Introspection has been unjustifiably regarded as impossible or impracticable. Yet, as we shall see, this mode of investigation offers no great difficulties and may be applied with marked advantage.

The chapters which follow represent an attempt to apply the scientific method in Psychology. The reader, therefore, will not find here mathematical demonstrations in the style of Herbart, nor will he meet with a neatly elaborated system seemingly flawless in every detail like that of Herbert Spencer. Speculation, metaphysical and non-metaphysical, and hypotheses, large and small, have been severely boycotted, their place being taken by a ceaseless and minute *experimental* examination of the facts, with a view to arriving at comprehensive statements or descriptions. The results, consequently, lay no claim to infallibility, and they obviously, like all work of a scientific character, especially as the ground covered is so vast, require corroboration, checking and extension.

The volume consists of three parts: Method, General Analyses, and Special Syntheses. Its most pervading feature is perhaps the organic conception of the life of thought and action which the inquiry has forced to the foreground. Hence the current notions as regards motives, pleasure-pain, reason, attention, association, habit, and the will,—which suggest no intricate and developed organic processes,—have been either rejected or considerably modified. Thus also the tripartite division into Intellect, Feeling and Volition has been replaced by a close analysis of the nature and satisfaction of Needs or functional tendencies. The key to the whole work is contained in chapters 7, 2, and 3. The nature of Needs dwelt upon more especially in chapter 7 forms the root out of which the conclusions of any importance may be developed; the process of attention, or the distribution of systems, examined in the second chapter,* goes far towards explaining chapters 3, 5, 10, and 11; while the fact of habit, or economisation, studied in the third chapter,† paves the way for chapter 4 and is implied throughout the work. Only chapter 8 stands somewhat aloof from its companions, as it attempts to show, in the spirit of Mach, that the traditional views on matter and mind are not borne out by a painstaking inspection of the facts. Perusing the eleven chapters the reader will perhaps recognise that *each chapter, and every portion of each chapter is, in the first instance, the outcome of research,* and that the final form, like an equation, merely represents the total labour expended and was in no particular case thought of before the examination had drawn to a close.

The work is more especially designed for the use of students. For this reason I have ventured on reviewing the extensive literature of normal psychology, quoting the opinions which are most generally held, and supplying almost a complete bibliography of the subjects dealt with. On the same account "asides" are inserted in the text to encourage observation and experiment on the part of the learner; the sectioning is continuous, so as to make reference easier; each chapter finishes with a bird's eye view; and a general summary (ch.

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* The substance of this chapter appeared in *Mind*, 1901.

† The substance of this chapter appeared in *Mind*, 1899.

12) offers a comprehensive survey of the whole work. Finally, a psychological terminology has been put forward which is intended to assist ready comprehension.

Readers need not go far to understand this work. For the purpose of avoiding perplexity, I have spoken of what every man can verify within himself; that is to say, I have made only casual references to physiology, evolution, anthropology, or to the study of children, of abnormal persons and of animals (sec. 11). This course alone prevented superficial treatment on the one hand and bulkiness on the other. I have been compelled, however, to deal at length with a few extraneous but interesting subjects as they were intimately connected with the chief conclusions arrived at. These are: the nature of genius, with special reference to Shakespeare (ch. 9); the nature of dream-life, as also the alleged facts of Spiritualism (ch. 10); and, lastly, the problems of æsthetics (ch. 11).

The point of view from which this work is written will, it is hoped, commend itself to the lovers of science. I have attempted to walk the straight and narrow path, and I have consequently declined to accommodate my conclusions to any party. To my mind, the amazing backwardness of psychology is principally due to its having been almost exclusively cultivated by philosophers or those philosophically inclined, *i.e.*, by those who have settled doctrines to begin with, instead of by men of science who possess only the desire for truth as such. This work will have fulfilled its author's purpose if it accentuates the need of, and assists in establishing, a psychology of a strictly scientific character.

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ERRATA

Page 17, l. 6 from below, for "physical" read "psychical"
,, 79, l. 20 ,, below, for "Habit." read "Habit?"
,, 80, l. 21 ,, above, for "Habits." read "Habits?"
,, 80, l. 15 ,, below, for "pocesses" read "processes"
,, 96, l. 9 ,, above, for "occasions" read "occasion"
,, 125, l. 6 ,, below, for "and" read "or"
,, 129, l. 14 ,, above, for "difference" read "differences"
,, 131, ls. 12 and 13 from below are to be transferred to the end of sec. 70a.
,, 148, l. 9 from above, for "remaing" read "remaining"
,, 186, l. 11 ,, above, for "re-membering" read "remembering"
,, 191, l. 5 ,, above, for "ultimalely" read "ultimately"
,, 207, ls. 21 and 22 from below, for "Allen" read "Allin"
,, 217, l. 9 from above, for "similiar" read "similar"
,, 230, l. 5 ,, below, for "praise" read "condemn"
,, 239, l. 9 ,, above, for "uutractable" read "untractable"
,, 256, l. 6 ,, below, for "Practice" read "Practise"
,, 258, l. 1 ,, below, for "normla" read "normal"
,, 346, l. 18 ,, below, for "Arber" read "Arrer"
,, 349, l. 16 ,, above, for "perfections" read "perfection,"
,, 395, l. 9 ,, above, for "geuius" read "genius'

PART I

METHOD

CHAPTER I

INTRODUCTION

If the method be but true,
Ours shall be the truths we woo.

I.—THE FOUNDATIONS OF PSYCHOLOGY.*

OF late it has almost become the fashion to assume that the foundations of psychology are firmly laid, and that all that remains is to work out problems of secondary importance. It is argued that we have now only to apply the knowledge which has been gained, and to occupy ourselves with an exhaustive examination of the psychology of the child, of races, of animals, and so forth. If this be so, the reader should find in this book a methodical restatement, a dogmatic exposition of the established body of psychological conclusions. Should he expect that, he will be disappointed. According to my interpretation of the data, the ship of psychology is still in mid-ocean, still at the mercy of storms of doubt, still without chart or compass, and still far from port. I maintain not only that the elementary principles of psychology have still to be established; but I believe that, from the scientific point of view, no serious attempt has yet been made in that direction.

So daring an assertion necessitates a prolonged defence. When a literature is so voluminous as is that of psychology—when Americans, Englishmen, Frenchmen and Germans are vying with each other in the production of learned treatises, it seems almost madness to suggest that the scheme of operations is strategically suicidal, and that nothing but a retreat to the base, and a new plan of campaign, can ensure success. However, such is my contention, a contention which, in the interests of science, I feel bound to make and to substantiate. Grave as is my task, its gravity is yet exceeded by its unpleasantness. One shrinks, and never ceases to shrink, from the unwelcome duty of sounding a retreat. The heart almost fails when one has to announce to others that the news of victory which we all greeted with joy, is void of truth. Yet, while destructive criticism may give rise to bitter disappointment, we endure it because of its ultimately beneficial effects.

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* "Not Descartes, nor Malebranche, nor Locke, nor Berkeley, nor Hume, nor Leibnitz, seem to be acquainted with this word" (Boirac, article "Psychologie," in *La Grande Encyclopédie*, 1900).

In accordance with the only justifiable mode of procedure, I shall attempt to make good my contention by an appeal to history. First, we will dwell upon the history of the famous doctrine of the Association of Ideas—a doctrine which, while generally correct in its contention that every given idea is connected with the idea which preceded it, is, as I hope to show hereafter (secs. 88-92), quite in error when it reasons backwards, that the likeness between two ideas makes the one follow the other, since, as I hold, relevancy to a topic determines which, if any, of the part-ideas shall be developed.* In some form or another, Associationism was recognised, there seems little doubt, from the days of Aristotle right through the Middle Ages.†

It was Hobbes who in more modern times explained the flow of thought by having recourse to an associative principle. He held that one particular thought or portion of thought followed another because antecedent and consequent formed originally part of one continuous state, and for no other reason. To him, however vaguely he stated it (*Leviathan*, 1651, part 1, ch. 3), the principle of the Association of Ideas offered a complete explanation of consecutive thought. We are not, in this section, interested in the truth, or otherwise, of this supposed key. It need only be observed that there is no evidence that either Aristotle or his followers, or Hobbes, made an exhaustive study of the subject, for the purpose of either discovering or verifying the explanation. We are nowhere led to believe that these thinkers, for instance, endeavoured to take note of an entire section of thought lasting for a minute or so, and then applied their theory. Nor have we any reason to think that they examined a large number of examples in such a manner as to exclude prejudice and to make their conclusions comprehensive. Nor can it be said that they verified their results experimentally. Their method was the same as that of the geographers and naturalists of the Middle Ages, and completely unlike that of the school of which Galileo was one of the early champions. It is, indeed, an abuse of terms to call by the name of method a procedure from which all orderliness is missing. In the one case, the observer follows vague suggestions which are not verified. In the other, he pursues a method which has taken centuries in the shaping, and which is almost wholly secure against superficial reasoning. So long as science was left to Divine Philosophy, progress remained an impossibility, because of the absence of objective tests in the mode of inquiry. Science became fruitful when she evolved a method. The grounds on which she based it, we shall discuss later on. Suffice it to have shown that Hobbes and his precursors possessed no warrant for their conclusions. If they were right, theirs were courageous guesses, and nothing more.

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* In this section I am perhaps unduly severe towards the Associationists. While it is true that they offer no explanation of the *flow* of thought, it must yet be borne in mind that their principle of contiguity forms a valuable basis for such an explanation. The woodenness and hastiness of their statements, however, called for censure. (See secs. 90-1).

† See Hamilton, Note D** in his edition of Reid's Works; Croom Robertson, article "Association," in *Enc. Brit.*; Volkmann, *Lehrbuch der Psychologie*, 1894-5, pp. 452-6, note 4; Mervoyer, *L'Association des Idées*, 1864; and Ferri, *Psychologie de l'Association*, 1883.

Locke, in his *Human Understanding*, 1690, bk. 2, ch. 33, gave birth, in an incidental way, to the phrase Association of Ideas. He employed it in explaining certain obstinate and injurious associations which men, if they were careless, were likely to form. The theory plays otherwise no part in his system, and his short and casual reference makes it undoubted that he arrived at his conclusions by no scientific route.

Hobbes and Locke having watered the plant, it began quietly to grow. When Hume referred to it (*A Treatise on Human Nature*, 1739, bk. 1, part 1, sec. 4), it was already attracting a good deal of attention. The great and genial sceptic professed to expound a principle which was to the realm of thought—to psychology, what gravitation was to the material universe—to physics. Contiguity or proximity in place or time, resemblance, and cause and effect, were the three masters of the ceremonies, who allotted to each unit its position in a train of thought. Given these, and we had an explanation of the procession of things or mental phenomena, such as was established in regard to gravitation by Newton. These principles, it was held, were elemental, and could not be reduced to other principles; and one must admit that they were eminently plausible, especially when illuminated by means of a multiplicity of examples which led the student in a predetermined direction, and kept him from searching for instances of a conflicting character.

One single illustration must suffice. On a windy day I look at a field of barley, and observe how the blades bend in the eastern portion, and how, in succession, the contiguous blades, right to the western portion, also bend. Does it follow of necessity that the bending of one blade caused the next one to it to bend, and so on till the last of the series had bent? We know that this presents a false explanation; and hence we may assume it at least as possible that contiguous mental changes are not due to contiguous association at all.* The chief point, however, is that Hume's ably urged assertions were speculative and not scientific. He applied no canons in which we have confidence.

Meanwhile Hartley was pondering over the same problem. In 1749, ten years after Hume's treatise had appeared, he published his *Observations on Man's Frame*, which is an elaborate physiological vindication of Associationism, based on a theory of vibrations. He went further than Hume and allowed only for contiguity, or proximity in space and time. The student will observe, as he proceeds, how sadly ignorant we are at this late date, of the more intimate processes of the central nervous system. Hence Hartley's physiology was conjectural, and that is all one can say of his psychology. There is everything to indicate that he did not follow a scientific mode of procedure, as we understand it to-day, and that whatever his success, he only sought for proofs in the scholastic fashion.

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* See Paulhan, *L'Activité Mentale*, 1889, p. 422.

The physical sciences were, at that period, progressing by leaps and bounds, conquering realm after realm of nature. The pace was so swift that men felt assured that the millenium was near. It was then that James Mill published his work, *An Analysis of the Human Mind*, 1829. In this work, the elder Mill seemingly applied the scientific method to psychology; and he is not the first, if Ophelia is to be believed, whose practice was not consistent with his profession. According to him, the firmness of the associative process depended on frequency of impressions in conjunction with vividness (i, p. 83). He has been, and has remained, the Associationist *par excellence*. Yet, correct as he was in breaking with metaphysics, more correct than many later psychologists, he nevertheless mistook philosophic naturalism for scientific method. One might almost say that he discovered nothing; that he verified nothing; and that he only elaborated in a speculative fashion a speculative system. Though I agree that his work is profoundly stimulating, his conclusions were yet far from being in advance of those of Brown's, published some five years previously.

After Mill the elder, came a deluge of writers who laid more or less stress on Association, their explanations differing in detail only. Thus Hamilton (d. 1856) tells us (*Lectures on Metaphysics*, 1877, ii, p. 238) that "those thoughts suggest each other which had previously constituted parts of the same entire or total act of cognition," and that this law is "an ultimate fact" (*ibid*, p. 240). Shadworth Hodgson (*Time and Space*, 1865, pp. 266-8) contends that in any state of consciousness, the uninteresting part fades, and the interesting portion develops, thus forming a train of thought. Bradley, again (*Logic*, 1883, p. 278), argues that "any part of a single state of mind tends, if reproduced, to re-instate the remainder; or any element tends to reproduce those elements with which it has formed one state of mind."

John Stuart Mill boldly pressed the notion into philosophic service. Nevertheless, with characteristic hesitancy, he admits (Footnote in his father's *Analysis*, 1869, ii, p. 71) that "the highly interesting idea of the end in view . . . . determines, within certain limits, which of the ideas associated with each link of the chain shall be aroused and form the next link," a passing admission, which, if consistently elaborated, would have revolutionised the Associationist position. He also, like Hamilton, quotes to a similar effect, Cardaillac, *Etudes Elémentaires de Philosophie.*

Bain, in his *Senses and Intellect*, 1894, following Hartley, Brown and James Mill, again elaborated what had already been over-elaborated. Without being, unfortunately, one whit less speculative than his predecessors, he set himself more clearly to determine the supposed laws of

Association. Leaving aside compound and constructive association, and premising that he rejects, as derived, the law of contrast, the two remaining laws read as follows:—Law of Contiguity: "Actions, sensations, and states of feeling, occurring together or in close succession, tend to grow together or cohere, in such a way that, when any one of them is afterwards presented to the mind, the others are apt to be brought up in idea" (p. 341). Law of Similarity: "*Present* actions, sensations, thoughts or emotions tend to revive their like among *previous* Impressions or States (p. 486)." Yet even Bain *casually* allows, without recognising the radical nature of his admission, that recency and interest may influence the course of association between one antecedent and its consequent. He says, for instance: "If historical events have been recently in my mind, the events referable to this locality are suggested" (p. 595).

According to Spencer (*Psychology*, 1890, i, pp. 269-70) "the fundamental law of association of relations, like the fundamental law of association of feelings, is that each, at the moment of presentation, aggregates with its like in past experience." This, however, he explains (i, p. 416) "is the law of intelligence in the abstract," and "the change which actually takes place is the *resultant* of many tendencies acting together."

James (*Psychology*, 1890, i, p. 566) says similarly that "when two elementary brain processes have been active together or in immediate succession, one of them, on reoccurring, tends to propagate its excitement into the other," a thesis which he further develops on p. 567. Baldwin (*Senses and Intellect*, 1890) likewise gives his assent to the principle.

To return to England. Sully joins the chorus (*Human Mind*, 1892). Lloyd Morgan (*An Introduction to Comparative Psychology*, 1894) adopts the principle in a slightly modified form. He writes: "The recurrence of *a* will be followed by the recurrence of *l under similar marginal conditions*" (p. 72), and "only under similar marginal conditions will the impression *a* suggest *l*" (p. 72). He defends his slight heresy by saying that the first law of motion—viz., that a body, if left free, will move at a uniform rate and in a straight line,—is true, though bodies are never left free, forgetting that the marginal conditions are, according to him, essential. Stout (*Analytic Psychology*, 1896, and *Manual*, 1898-9) accepts the principle in a modified form. In one place (*Manual*, 1898, p. 74) he states, however, that "each phase of the process before the end is reached is incomplete, and tends by its own inherent constitution to pass beyond itself."

We have seen the manner in which Hobbes and Hume and their predecessors attained their results. The later English writers, including the latest, have pursued the same policy. Not one of them seems to have thought of testing the doctrine, as men are accustomed to do in scientific inquiries. From first to last, scarcely veiled speculation determined the opinion of English and American psychologists in so important a matter. A belief thus based can claim no respect on scientific grounds. It may be true or it may not be true; it certainly is not proven.

If we turn to Germany, we find that Herbart (*Lehrbuch*, 1816, p. 69), the founder of an important school, as well as Beneke, adopted Associationism. According to the Herbartian school, presentations hinder or facilitate others coming into 'the foreground of consciousness. The Herbartians possess an elaborate mechanism, reminding one of pulleys, levers, crowbars, cranes, and what not, for the transporting hither and thither of presentations. Of science there is not a grain.' Like Hans Andersen's tailors, the presentations appear to be busily engaged, but produce nothing. Such huge treatises as those of Volkmann, a follower of Herbart, and Lipps, a follower of Beneke, form the completest indictment of present-day psychological methods. Lotze, again (*Microcosmus*, 1885, i, p. 215), says: "That a newly-produced impression revives the forgotten idea of a previous and similar one, or recalls it to consciousness, is the simplest of the universal laws that regulate the course of memory." In Germany, then, we find, to a large extent, a similar state of affairs to that existing in England.

Paulhan (*L'Activité Mentale*, 1889), in France, with his Systematic Association, has broken through the tradition. He rightly holds that actions are determined by ends, and that each fraction of a train of thought is not determined primarily by its predecessor, but by the end in view. In a word, association is systematic or topical, and not atomic. To this view Ladd (*Psychology, Descriptive and Explanatory*, 1894) subscribes. Largely as I agree with Paulhan, I still wish to insist that there is no sign that he deduced his theory from scientific observation or has verified it in fact.

Taking Associationism as a whole, omitting for the present the experimental school, one feels justified in maintaining that its procedure has been unscientific, and its results, as will be shown, unsatisfactory. So far the foundations of psychology remain to be laid. (See sec. 90a.)

The most striking exemplification of unscientific method is offered in the case of Habit. Locke tells us (*Human Understanding*, 1690, bk. 2, ch. 22, sec. 10) that the "power or ability in man, of doing anything, when it has been acquired by frequently doing the same thing, is that idea we name habit." And in another place he compares the acquirement of habit to a path worn smooth, saying that repetition of action has the same effect on the brain. (*Ibid*, bk. 2, ch. 33, sec. 6.) This hazarded conjecture, utterly unsubstantiated, has been the first and the last word of the psychologists on the subject. As any well-known work on physiology will show, our knowledge of brain processes is unspeakably inadequate to permit us to make such an assertion. When we come to psychology, we find no other confirmation than popular rumour might lend; there is not even the faintest suspicion of scientific caution. Everybody acknowledges what has not even been tentatively examined. So complete has been the acceptance of this theory that the leading psychological journals, such as *Mind* (omitting my own contribution), *The Psychological Review*, *The American Journal of Psychology*, *Brain*, and *Philosophische Studien*, have not a single contribution on the subject, whilst the *Revue Philosophique* had one article twenty-six years ago. This is not owing to indifference. James and others insist upon its importance at some length, and there are few psychologists who pass it by.

Yet the feeblest attempt at investigation would have shown the difference between complacent popular acquiescence, which selects some superficial aspect, and scientific comprehension, which points to the general facts. The complex nature of habit the student will find exhaustively discussed in ch. 3.

As a third illustration in point, one may take Attention. The subject is part of the time honoured stock-in-trade of psychology. It is also one which has been seriously studied; and the failure in this case has, therefore, not been so complete, though even here a *certain degree* of attention has been generally mistaken for attention, as such. Had there been only a consistent and thorough neglect of data other than those arrived at by direct study—a neglect of metaphysics, of irrelevant theology, of slipshod theory, of commonplaces, we might be near the end of its problems instead of near the beginning. The trouble has been that theories have so darkened the minds of students, that the light of the most powerful intellects scarcely shed a glimmer along the path. By means of almost superhuman efforts a trifle was gained here and there, and these trifles tended more to bewilder than to encourage. The primitive tools worked wonders. Taking a general survey, however, the subject is still buried in obscurity, though the outlook is not so unpromising as in the two other cases. As I hope to explain in ch. 2, attention is not an intermittent process requiring strain, but it is activity itself from the point of view of the direction in which it is engaged.

The three illustrations I have given—Association, Habit and Attention—are, I believe, typical of the present-day state of reflective psychology as a whole. They justify the contention that the scientific foundations have still to be laid.

When one turns to those who emphasise the physiological aspect, scholars such as Maudsley (*Physiology of Mind*, 1876), Lewes (*Problems of Life and Mind*, 1874 9), and Bastian (*The Brain as an Organ of Mind*, 1880), one is even more disappointed. I fully appreciate their insistence upon the neural aspect of thought, with which their work began and ended; but their positive results were most meagre, since they tried to establish a fictitious psychology by means of an admittedly fictitious neurology.

The work of the psycho-physical school will be examined in sec. 8.

What is the nature of the method which I have called unscientific and barren? It may be illustrated as follows. Owing to a new departure in psychological thinking some fresh problem has arisen, say, the problem of effort. Men ask themselves accordingly what is effort, and in asking recall what seem relevant illustrations. These illustrations, being what is uppermost in thought, display some particular and striking characteristic, and men then turn over the old clothes of memory for proof. At the same time they more or less carefully note this or that particular case of living effort. Meanwhile (sec. 160) the suggested solution attracts as much what is favourable to itself as it prevents from developing what is unfavourable to the theory, while the situation is aggravated by the fact that the actual things observed are illegitimately suggested by the hypothesis. Thence follows some chance conclusion which, psychologically considered, appears firmly based. As against this method, I would advise the exhaustive study of a large variety of facts, with no anxiety—until we have proceeded far—to obtain conclusions. We would apply impartially such rules as shall eliminate any bias (sec. 136), and we would lay no stress on anything recollected unless it be something due to careful examination, and unless we have, by rule (sec. 136), exhausted all the relevant material to be found in the memory, the stores of which are useful for conduct, but not for eliciting truths. Such a method, I hold, is scientific, fruitful and well-based. Such a method, I claim, is the quintessence of the scientific method as applied in the physical sciences. Instruments and mathematical treatment may supplement it, but not displace it. These latter only give polish and precision to the great truths otherwise obtained. [*Let the student observe that the mere neglect of metaphysics or theology will not assist him in the discovery of truth.*]

2.—THE USE OF HYPOTHESES.

In his *Comparative Psychology*, Lloyd Morgan tells the world that "Psychologists make, or should make, no claim to any monopoly of knowledge in the subject they study; their province is mainly to systematise that knowledge" (p. 44). Fortunately for us, this author's practice is not in accord with his theory, for his conception of focal and marginal consciousness forms a valuable contribution to psychology. Nevertheless there is incalculable mischief in his assertion, however hedged round. What would be thought of a physicist or an astronomer who mainly systematised knowledge without seeing that it was gathered at first hand by competent specialists or by himself, or who gave a *locus standi* to "the plain man of shrewd insight"? The idea is monstrous. A psychology which mainly busied itself with systematising the conclusions of "those who are not professed psychologists" might as well relieve Sisyphus of his task. The one is as likely to be successful as the other.

Underlying the statement I am criticising, there is an unpleasant truth. Unhappily, psychologists have been too anxious to systematise that which they had not previously examined. They leaned fatally to the opinion that truth could be sifted from popular notions as is sand by means of a sieve. The student must recognise once for all that if he is to be on the scientific plane he must make a claim on behalf of psychologists to a "monopoly of knowledge," and that he must not attempt to systematise what has not been procured through the application of scientific methods. It has been the bane of psychologists that they have tacitly assumed that facts of consciousness do not require to be collected with the disciplined care which other sciences employ. I have advisedly said "tacitly" assumed, because few men have spoken out boldly as Lloyd Morgan does. The mischief has lain in unthinkingly proceeding along the wrong path, in giving elaborate explanations of popular fictions, and in not deliberately recognising that in psychology, as in physics, unbridled speculation is criminal waste.

It is always dangerous to make unqualified statements. Instead of condemning speculation outright, it would be perhaps better to pronounce sentence against it when its excursions are not rigorously limited. Few can object when "speculation is but the play of the imagination along the fringe which borders our knowledge" (Lloyd Morgan, *Comparative Psychology*, 1894, p. 323). But then we must insist upon a reasonable interpretation which shall not make the fringe equal to the robe to which it belongs. Speculation thus interpreted is not only innocent; it is an imperative necessity. If men formed hypotheses about the things on the borders of knowledge, they would never go far astray, and often return laden with trophies. Let me, however, define this term. "By an hypothesis we understand an assertion which is employed as a principle of explanation, though its correctness is yet unproven" (Volkmann, *Lehrbuch*, 1894, i, p. 103). I should say, then, that accepting the above definition, hypotheses are legitimate when they apply to the fringe which borders our knowledge. In thus limiting their uses one seems not only to be cutting at the root of ordinary psychological speculation, but to be contradicting weighty authorities. According to Jevons, study without hypothesis is not scientific. "The true course of inductive procedure is that which has yielded all the more lofty results of science. It consists in *Anticipating Nature*, in the sense of forming hypotheses as to the laws which are probably in operation; and then observing whether the combinations of phenomena are such as would follow from the laws supposed" (*Principles of Science*, 1877, p. 509).

The fallacy underlying the preceding statement must be exposed. Where, the student should ask himself, do we find our hypotheses? Do they come to us as divine intuitions? Can we obtain them, or any new truth, by a course of abstract reasoning? Or is it not rather that we act on the basis of one observation, and note "whether the phenomena are such as would" be in accordance with that observation? This must obviously be the case, for no compounding of zeros can force the gates of nothingness. If that be so, Jevons' statement implies that there are no hidden facts which are not amenable to casual and superficial observation. That, as we shall see, is an indefensible position. There is no guessing which can take us farther than the fringe which borders our knowledge. We may set up the wildest theory, and yet it will be composed of what is known, its extravagance arguing no fresh knowledge. Take, for instance, a passage from Volkmann, which well illustrates the length to which fanciful speculation or adaptation may go: "The presentational mass, which is helplessly sinking, meets with the freely-rising apperception mass, is gripped and firmly held by that, and placed before the ego as an object to be viewed" (*Lehrbuch*, 1895, ii, p. 206). This pretentious psychic mechanism to which we are here introduced is but a copy of material mechanisms, and the hypothesis underlying its use implies that analogy holds the key to the whole realm of the unknown, while the truth is that *the master facts of a science are due to deliberate research.* It is for this reason that one can scarcely detect a single sound brick in the elaborate Herbartian structure—unsophisticated observation of a scientific type has been scouted, and hypotheses were powerless to discover the new facts.

If my interpretation be correct, the progress of science should bear me out,* as indeed it does. The serious study of fact is continually going hand in hand with tentative speculation "along the fringe which borders our knowledge." Workers here and there wrest from nature trivial secrets. These secrets accumulate, and men now and then tentatively combine a few of them. As the store of knowledge assumes considerable proportions, so larger and larger generalisations are ventured upon in every direction. At last, when general statements of a far-reaching nature abound, men rightly venture to speculate as to the broadest generalisations possible. Already the chief notions are in the air; already those engaged in the search feel that they are approaching a solution. After many minor attempts some one, a Newton or a Darwin, sometimes comes to the front and completes the structure. As knowledge progresses, new speculations and observations "along the fringe which borders our knowledge" are readily suggested and easily verified. *No stupid guess is possible to the man who has ascertained facts to go upon; and when he goes astray, the clashing of his theory with his existing store soon brings him back to the right path.* Progress, though slow, is hence certain and reliable when men shun the use of large hypotheses. In the absence of well-ascertained facts, everything is changed. A guess, under these conditions, has no inherent plausibility, and what is as bad, any attempt at verification in an unexplored realm can only end in failure either acknowledged, or, as is more usual, disguised. Our intellectual sense of equilibration forsakes us when it has no general facts to assist it. Thus large hypotheses in neurology are not only worthless, but vicious, because it is only by the accumulation of facts and generalisations that solutions of neural difficulties can be reached at all. Sciences cannot be, and never have been, guessed at. Jevons' mistake was a plausible one. In the physical sciences so huge a body of organised observations has been accumulated that the guesses of men of learning are at once permissible and easily verified. Where, on the other hand, as in psychology, the stock of genuine observations is infinitesimal, these guesses will be unreasonable, and their verification will consist of an immensely protracted process, equal to the building up of the science itself. Indeed, Jevons supplies his own antidote. He says of the alchemists, of whom Newton was one, that "Many of them were men of the greatest acuteness, and their indefatigable labours were pursued through many centuries. A few things were discovered by them, but a true insight into nature now enables chemists to discover more useful facts in a year than were yielded by the alchemists during many centuries" (*ibid.* p. 505). The alchemists, like many present-day psychologists, indulged in large hypotheses, and large hypotheses are useless, are *impedimenta* in more senses than one.

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* See, however, Rigg, *The Place of Hypothesis in Experimental Science*, 1887.

I, therefore, side with Bacon (d. 1626) who says: "The subtilty of nature is far beyond that of sense or of the understanding: so that the specious meditations, speculations, and theories of mankind are but a kind of insanity, only there is no one to stand by and observe it" (*Novum Organum*, ed. 1893, bk. 1, x); and who draws this admirably prophetic picture of some modern thinkers: "When any one prepares himself for discovery, he first inquires and obtains a full account of all that has been said on the subject by others, then adds his own reflections, and stirs up, and, as it were, invokes his own spirit, after much mental labour, to disclose its oracles. All which is a method without foundation and merely turns on opinion" (*ibid*, bk. 1, lxxxii). Bacon has been roundly attacked for his views, which are all too sound. Even Newton has not escaped chastisement. His celebrated pronouncements against hypotheses are discounted on the assumption that he himself gained his great successes by their means. The censure on him is wholly inapplicable, for his great generalisation was no more self-evolved than that of Darwin. No man of his attainments could have been far wrong in his surmises, and the accumulations of organised knowledge were so extensive that verification was within easy reach. Newton focussed the learning of his time. When he goes beyond that, as in his conjectures concerning general stellar problems, he is only a wordy theologian. Hence, regarding the term hypothesis as implying a supposition which is not preceded by exact study, we can heartily agree with Newton's strong and unmistakable language. "Whatever is not deduced from the phenomena, is to be called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy. In this philosophy particular propositions are inferred from the phenomena, and afterwards rendered general by induction" (*Mathematical Principles*, trans. by A. Motte, 1729, ii, p. 392). Compare this hesitancy with the impatience of a modern writer: "Give us theories, theories, always theories!" (Baldwin, *Mental Development*, 1895, p. 38); or compare it with the speculative deductions of the learned Whewell: ". . . an Art of Discovery is not possible. At each step of the progress of science, are needed invention, sagacity, genius—elements which no Art can give. We may hope in vain, as Bacon hoped, for an organ which shall enable all men to construct scientific truths, as a pair of compasses enables all men to construct exact circles" (*Philosophy of the Inductive Sciences*, 1847, p. viii. See also his *Novum Organon Renovatum*, 1858).

The essential thing for the student to remember is that the chief facts of every science are only obtainable by the close observer after laborious research.* Let me give one illustration. What are dreams? Seeming to resemble the waking imagination, we forthwith guess that they are the result of vivid imaginings. Quantities of books had been written on the subject, based on speculation and occasional observation. Yet proper light only began to be thrown on the problems of dream-life when men methodically and for a considerable period observed their own dream-states. Excepting such contributions as those of Giessler and Schwartzkopff, most of the books are almost superfluous. Let me now state the dream facts as they appear to me (ch. 10). (1) The muscular and sensory tones are lowered, and the position of the various parts of the body is unknown (sec. 19, 1st and 2nd conclusion). (2) The characteristic pictures spring usually out of the dark or closed-eye field of vision, and are not imaginings at all. (3) Most of the dreams are initiated and maintained from without, resembling waking life and not waking imagination. (4) The amount of possible effort is largely reduced, whence follows confused thinking, (5) impossibility of strenuous thought, (6) inappropriate recollection, (7) a strong tendency for appetites, expectations, doubts, hopes and fears to actualise themselves, (8) the continual creation of a setting to each picture, giving it an air of reality, and (9) the fact that the happenings are compounded out of most recent events and those immediately passed. Thus points (2) and (3) argue afferent or outer influences, and the other points follow from the lack of strenuousness. Now, by what rational calculus could one have jumped from imaginative seeing to the retinal pictures which are plainly due, in part at least, to new circumstances. And, suppose we had not previously ascertained the fact, how could we have discovered the arbitrary creation of settings to the dream-pictures? The two essential facts of dream-life are afferent, or outward, influences and a drop in strenuousness. Yet the waking imagination has nothing to do with either of those factors: it tends away from outer impressions and implies considerable force of thought. Where, we may ask accordingly, lies the difference between the methods of ancient philosophy and those of current psychology? And who would ever confound scientific with philosophic procedure? The traditional philosophic method is as barren as the syllogism which it has produced. It may, therefore, be laid down for the student's guidance that scientific progress depends on gaining new classes of facts, that such can only be acquired by painfully close and methodical observation in the first instance, and that they are not obtainable by employing hypotheses which go beyond well-ascertained facts and established generalisations. As Tyndall puts it: "The thing to be encouraged here is a reverent freedom —a freedom preceded by the hard discipline which checks licentiousness in speculation" (*Scientific Use of the Imagination*, 1872, p. 33).

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* Men are sometimes said to stumble upon important discoveries. In such cases it is the preparedness of the discoverer which accounts for the discovery.

Adam, *L'Imagination dans la Découverte Scientifique*, 1890; Boirac, *La Méthode Expérimentale*, 1898; Naville, *De la Place de l'Hypothèse dans la Science*, 1876; Naville, *Les Conditions des Hypothèses Sérieuses*, 1877; Naville, *Les Principes Directeurs des Hypothèses*, 1877; and Venn, *The Use of Hypotheses*, 1878.

3.—APPROACHES TO THE STUDY OF PSYCHOLOGY.

To understand the human frame, we require to know its constitution to the minutest part, together with its reactions when stimulated: a microscope and a dissecting knife, with a battery, might be an adequate equipment for this task. As matters stand, these tools are found to be inadequate, and secondary means are, therefore, resorted to in addition. We study the development of the embryo, animal characteristics, evolutionary traits, and cases of disease or malformation. We also stain the tissues with preparations which affect only certain parts; we cut nerve bundles, as we might cut strings, and notice which of the nerves degenerate as a consequence; and we experimentally alter or remove structures or parts of structures.

With no understanding, or next to none, of actual structure, the secondary means would be of less than doubtful value. Vague and diffuse observations would of necessity be followed by vague and diffuse conclusions.

So with psychology. In the absence of a power of self-observation, advance would be barred, for secondary means can only be helpful when the primary approach is not virtually closed. If a direct approach be impracticable, we shall be compelled to rest satisfied with vague hints. Yet, taking a broad view, our aim is to ascertain the whole edifice of thought by experimentally looking within, or, as it is called, by introspection. Not until this approach is found to be demonstrably inaccessible like the centre of the earth is now, may we think of applying other methods. Most thinkers have, however, despaired of obtaining a satisfactory peep into the thought jungle, and have consequently advocated secondary means of attaining their object. One of these means which Herbart eloquently advocated, the use of hypotheses, I have already examined and rejected. The others are as follows: *retrospection; the comparative study of children, races, animals, criminals, the insane, hypnotised and diseased persons; as well as the examination of products such as facial expressions, monuments or books.* As I believe that introspection is eminently practicable, I consider the other means to be of secondary importance, and shall refer to them only incidentally, if at all.

4.—INTROSPECTION.

The difficulties of introspection were insisted on at an early date by Hume: "It is remarkable concerning the operations of the mind, that, though most intimately present to us, yet, whenever they become the object of reflection, they seem involved in obscurity; nor can the eye readily find those lines and boundaries, which discriminate and distinguish them. The objects are too fine to remain long in the same aspect or situation; and must be apprehended in an instant, by a superior penetration, derived from nature, and improved by habit and reflection" (*Inquiry*, 1747, sec. 1. See also Hume's Introduction to his *Treatise on Human Nature*). If the objects "must be apprehended in an instant," reasonable observation is out of the question; but we are convinced that absence of adequate introspective training accounted for Hume's opinion.

To one hypothesis we owe almost the entire neglect of introspection. Auguste Comte (d. 1857) maintained that "the affective functions, and yet more the intellectual, exhibit . . . . this particular characteristic, that they cannot be observed during their operation, but only in their results" (*Positive Philosophy*, 1875, tr., i, p. 382). This belief, never thoroughly tested, pervades most criticism. Herbart* (*Psychologie*, i, p. 206), says: "Do you intend to observe yourself passively, so as to clearly perceive what is

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*For accounts of Herbart and Herbartians, see Stout, *The Herbartian Psychology*, 1888; Stout, *Herbart compared with the English Psychologists*, 1889; Stout, *Herbart's Disciples*, 1889; Ward, article "Herbart," in *Enc. Brit.*, 1886; Ribot, *La Psychologie de Herbart*, 1876. See also my account of Herbart in sec. 80.

proceeding within? Only the sooner will everything that was to be seen, become dark, and very soon the spectator will only face himself and his own attitude." Again, in his *Lehrbuch*, 1816, p. 56, he says: "That which we are specially anxious to observe within ourselves, becomes confused during the inspection." If Herbart be correct, then self-observation becomes useless; but here, too, we see that the existence of an indivisible ego is implied, for why otherwise should not one state be able to exist alongside of another state. Herbart's disciple, Volkmann,* takes sides with equal boldness. Introspection "pre-supposes a breaking-up of the observer in a subjective portion which observes and an objective portion which is observed. . . . Outside its range fall all those phenomena which, like passion, arduous thinking, . . . and attention, pre-suppose the undivided concentration and devotion of the whole process of presentation" (Volkmann, *Lehrbuch*, 1894, i, p. 41). And again, "the effort of the observer appreciably alters the object to be observed . . . The more seriously we wish to observe ourselves, the less do we find to observe" (*ibid*, p. 42). Thus Waitz (*Psychologie*, 1849, p. 673), another Herbartian: "The keenest self-inspection reveals only what is past." So Nahlowsky (*Das Gefühlsleben*, 1862, p. 6), still another Herbartian: "As long as one is subject to a certain feeling, it is impossible to attend to it; we become acquainted with it only through memory." Thus Brentano, *Psychologie*, 1874, pp. 35-6: "Objects which, as the saying is, are perceived without us are amenable to observation. . . . To objects which are perceived within us this procedure is totally inapplicable." In a similar vein Wundt (*Grundriss*, 1896, p. 25) says that "the intention of observing, which must exist in all exact observation, materially affects . . . psychic processes." Why, in the nature of things, this should be, he leaves unexplained. Kant (*Anthropologie*, 1800, p. x), who, like Herbart (*Psychologie*, i, p. 233, and other places), confounds self-observation with morbid self-consciousness, writes: "The man who desires to explore his inner life puts himself in a critical condition, especially where the feelings are concerned, *i.e.*, when his impulses are in action, he cannot observe himself, and when he observes himself, his impulses are at rest." Ebbinghaus (*Psychologie*, 1897, i, p. 57) tells us that self observation "cannot clearly and objectively apprehend the things towards which it is directed; it unavoidably displaces and falsifies them." Jodl (*Lehrbuch*, 1896, p. 10) says that his remarks do not imply "the impossibility of introspection, but only a difficulty, now more, now less, prominent in certain cases." Thus Heinrich, *Die moderne Psychologie*, 1899, p. 97: "In self-inspection we can only note that which, on the ground of a hypothesis, we wish to observe; for introspection is made possible only by the reproduction of the phenomenon; and in reproducing we are always determined by a settled opinion."

Maudsley, who cannot be suspected of possessing metaphysical bias, also reasons against introspection. "To direct consciousness inwardly to the observation of a particular state of mind is to isolate that activity for the time, to cut it off from its relations, and, therefore, to render it unnatural. In order to observe its own action, it is necessary that the mind pause from activity; and yet it is the train of activity that is to be observed. So long as you cannot effect the pause necessary for self-contemplation, there cannot be a sufficient observation of the current of activity: if the pause is effected, then there can be nothing to observe; there would be no consciousness, for consciousness is awakened by the transition from one physical or mental state to another" (*Physiology of Mind*, 1876, p. 17). To which we reply that the dilemma does not exist for the skilled observer. Hamilton is unambiguous. "Before we can observe a modification, it is already altered; nay, the very intention of observing it, suffices for the change. It hence results that the phenomenon can only be studied through its reminiscence" (*Metaphysics*, 1877, i, p. 379).

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* For an account of Volkmann, see Whittaker, *Volkmann's Psychology*, 1890.

Ward is equally unfriendly, as is Stout. The former speaks of ". . . . the very obvious fact that our powers of attention are limited, so that we cannot alter the distribution of attention at any moment without altering the contents of consciousness at that moment," implying, as I understand him, that each observation occupies the whole field of attention or that the connection between what co-exists is organic (*Psychology*, 1886, p. 37). The latter says: "It has been maintained that all so-called introspection is in reality retrospective. On this view, the modifications of our consciousness vanish on being noticed, so that we do not apprehend them until they are past. We shall see later on that there is sufficient justification for this doctrine" (*Analytic Psychology*, 1896, i, p. 13).

The remaining English psychologists whom I shall quote, write in a similar strain. Sully says: "The very directness of the inspection gives rise to special difficulties. For all accurate and scientific observation requires a certain aloofness of mind and absence of all but a purely scientific interest in what is observed. When, however, we are called on to observe our own mental states we cannot put ourselves into this cool scrutinising attitude. The same person whose mind is agitated by a passion is required to dispassionately inspect its characteristics. Thus in the very process of observing we necessarily change the phenomena to be observed" (*Human Mind*, 1892, i, p. 16. See also his *Illusions of Introspection*, 1881, pp. 11-8). John Stuart Mill, as usual, is non-committal, saying that at all events retrospection is possible (*Auguste Comte and Positivism*, 1865, p. 64). Lloyd Morgan is also a hostile witness: "Directly we begin to examine and measure any part of the margin, it thereby ceases to be marginal and becomes focal" (*Comparative Psychology*, 1894, p. 19). "We cannot examine the physical wave as it passes; we can only endeavour to focus it, or its constituent parts, in the mental vision, *as it was when it was passing*" (p. 20). Again, "Introspection always deals with past experience. . . . Introspection is thus always retrospection" (*Psychology for Teachers*, 1894, pp. 83-4).

Turning to America, opinion is also almost unanimous against introspection. James, in his characteristic style, says with regard to thoughts and feelings: "Whilst alive they are their own property; it is only *post-mortem* that they become his [the psychologist's] prey" (*Psychology*, 1890, i, p. 189). And Baldwin: "All our mental states are rendered more intense by the attention: consequently as soon as the state observed comes within the range of fruitful observation, it is changed, both in its own integrity and in its relative importance in the mental life" (*Senses and Intellect*, 1890, p. 10). So Titchener: "Direct introspection—observation of a process which is still running its course—is, as a matter of fact, entirely worthless; it defeats its own object" (*An Outline of Psychology*, 1896, p. 33).

Egger, in a dissertation on internal speech, pronounces against introspection and for retrospection. "Instead of observing directly our present condition," he says, "let us interrogate our memory" (*La Parole Intérieure*, 1881, p. 79). Paulhan (*La Perception Interne et la Psychologie*, 1888) sails round the subject, enlarging upon the possibilities of error. Ribot (*Psychology of the Emotions*, 1897) speaks of introspection, "always an uncertain guide which leads us but a little way" (p. vi).

The army of the faithful is very small. Lewes (*The Study of Psychology*, 1879) seems to support the possibility of introspection unconditionally. Ladd and Münsterberg are, generally speaking, favourable. The former sensibly remarks that "the risks, limitations, possibilities, and proper uses of introspection in psychology can only be made known in connection with the development of the science itself" (*Psychology*, 1894, p. 15), while the latter rightly urges that talent, training and appropriate knowledge are requisite (*Ueber Aufgaben*, 1891). Yet, however, in another place Münsterberg writes: "To direct the attention, or the will, to our volitions, would mean the possession of a doubled self-consciousness, and is, therefore, a complete inner contradiction. Psychological analysis is, in consequence, restricted to the memory pictures of inner processes" (*Die Willenshandlung*, 1888, p. 57). Lipps (*Grundtatsachen*, 1883, pp. 10-1) rebuts the attacks on self-inspection in a general way. Beneke holds views as strong as mine, though one cannot detect any attempt at realising those views: "As for the objection that self-observation is impossible, it can be made only by those who have never seriously set themselves the task" (*Neue Psychologie*, 1845, p. 15. See also the preface to Beneke's *Lehrbuch*, 1845). So Robertson (*Elements of Psychology*, 1896, p. 14) says: "Without making light of the difficulties attending introspection, we may therefore rest satisfied that there is no reason why it should not, when properly conducted, lead to results of a purely scientific character." But this is a mere theoretical plea. Similarly Bailey (*Letters*, 1855-63), especially in his Third Series, pp. 1-13, argues in favour of introspection as against Comte. No application, however, is made by Bailey of the introspective method.

We have heard the witnesses for and against. Almost without exception, the testimony, directly or by implication, against introspection is crushing.

My reply is as follows: *retrospection is, of necessity, introspection, and if, therefore, introspection be impossible, our minds are absolute blanks.*[*] All that can be said in favour of the former is that memories are less vivid (Münsterberg, *Ueber Aufgaben*, 1891, p. 171). On the other hand we must note that memory is but a poor copy, most of the details disappearing, and the very faintness being as often as not an obstacle to observation. Observe yourself, for instance, when you are being surprised, and compare your notes with those gained from a previous recollection of a state of surprise: the difference is that between poverty and wealth, while, at the same time, prejudice is more likely to alter what is faint than what is vivid. Psychologists speak of obtaining furtive glances; but if we reflect that only sustained and close observation is ever of use, we shall learn that these glances have no scientific value.

Let us now meet the chief charge by an illustration. Listening to a light conversation, I, at the same time, study the cover of an art journal and also tap the table; but, on another occasion, when I attend to a difficult argument, all my activity is absorbed in the one task of comprehending what is put forward. Attention, then, need *not* be directed to one object alone. Indeed, as we shall see in ch. 2, normal attention represents a stable quantity, and in proportion as an object requires less than that quantity, so we attend in two or more directions. To the attention it is indifferent whether we attend to five separate objects or to one. Hence, as we become absorbed in one direction, all other things fade—we hear nothing, we see nothing, we feel nothing, we think of nothing but what we are absorbed in. Suppose now that I am looking at the reading lamp before me. As my whole attention is not required to perform the feat, I can still hear the fowls running to be fed. Now it does not matter to the attention, as such, what I do as long as I do not leave it unoccupied. Further, the mere shifting, as such, of one portion of the contents does not necessarily interfere with the other portions. I can be attending to one object continuously while changing the other contents. *The various unrelated objects of thought, to all intents and purposes, are like so many logs of wood lying at a distance from one another and removable separately.* Only one condition must any second object of thought fulfil, it must not make such a call on our attention as shall interfere with the first object of thought. Let us apply this. To attend to a trend of thought or action is possible in so far as the second trend of thought does not, owing to its volume, affect the first one. Since, then, attending to the object of our attention, with those who are trained, requires the veriest trifle of exertion, it follows that the artificial objections against introspection fall. There is scarcely a passion so wild, or a dream so subtle, that a trained psychologist cannot collectedly turn round and with freedom inspect the related process.

This is not the place to go into fine details. The student, who takes his study seriously, and who knows that without effort nothing worthy is achieved, will persist, according to instructions, until he can walk about the thought smithy as self-possessed as the physicist in his laboratory. Great authorities who, like great mountains, echo each other, must not impose upon him. He must test, and not slavishly obey.

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[*] "A mental state that is past is a mental state no longer, and to be unable to know it as present until it is past is to be unable to know it until it is non-existent and is as such beyond being known at all" (Hodder, *The Adversaries of the Sceptic*, 1901, p. 41).

In view of Wundt's criticism (*Selbstbeobachtung und innere Wahrnehmung*, 1887) of Volkelt, it will be well to fix the meaning of the term Observation. For instance, a speech repeated by the phonograph in my hearing, while I was absorbed in thinking out some problem, never existed for me, that is to say, if I had a perfect memory and deliberately recollected the period during which the instrument was at work, I should not be able to recollect the speech. Again, the speech repeated by the phonograph in my hearing, while I was not otherwise engaged, did exist for me. A perfect memory would prove that. However, lacking an unexceptionable memory, I may have forgotten what I heard. In the latter case the final effects of hearing and not hearing are equally negative, though there was observation of the speech in one instance and not in the other. If we add, then, to the ordinary observant state an implicit desire to remember what is observed, and set the phonograph at work again, the effect will be that I not only heard a speech, but that I also am pretty certain to remember it. The presence of the implicit desire, however, gives rise to no important modification, *i.e.*, if a perfect memory reproduced both sets of observations, the differences would be insignificant. Accordingly, scientific observation always looks beyond the moment, and carries with it, therefore, the implicit desire spoken of. Now what is true of observation holds of introspection. I may observe comparatively little; I may observe much and forget it almost instantly; or I may observe as well as remember, because there is an implicit desire to do so. Hence both in outer and inner observation the implicit desire to remember is essential for scientific purposes. To deny that we discriminate is to assert that nothing exists. If, then, discrimination be a fact, it becomes a question whether the implicit desire to remember introduces a fatal factor in introspection. My contention is that it does not; and that a perfect memory would reveal nothing appreciably different from what is actually disclosed. There is only one danger we must guard against. When we attend to a slightly discriminated state, say to what lies in the margin of vision, we must not assume an attitude which would transform it into a highly discriminated state, as by focussing an object. We must remain unbiassed spectators, a thing not at all impossible. Indeed, the slightly discriminated state may be produced experimentally just as much as the opposite state. Our conclusion, then, is that while discrimination, inner and outer, varies, the implicit desire to remember what has been discriminated, or to observe what is being discriminated, introduces no disturbing factor in the case of a skilled observer.*

5.—Practical Psychology.

In the physical sciences it is considered essential that a student should be experimentally trained. One who only knows chemistry from books, or even from observing demonstrations, is not regarded as seriously acquainted with it; and one who is ignorant of practice is generally not considered as trained in that subject. What we have just said concerning the physical sciences must in the future hold of psychology. A student not trained in psychologising or in performing introspective experiments, is a superficial amateur.

The method-in-chief which the psychologist has to employ is that of introspection. The student must, therefore, practise that art until he has fairly mastered it. Ordinary scientific observation is unquestionably beyond the uninitiated.* This is also true of self-observation. At first we must expect the student to be helpless and inefficient. Only with time and practice will his ability to grapple effectually with psychic facts assume any considerable proportions. Like every discipline, psychology has its own difficulties which the student must overcome. Failure at first should no more discourage or dishearten him than the corresponding failure to ride a bicycle easily and gracefully when mounting one for the first time. He must judiciously practise until the so-called impossibilities, of which we heard so much in the last section, become commonplace realities.

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* See Volkelt, *Psychologische Streitfragen*, 1886, pp. 8 ff. Volkelt's theory is that self-observation consists in involuntarily consulting the memory contents (*ibid*, p. 12).

"Be normal" in your psychologising, is the supreme rule. To show nervousness, to become excited, to be full of anxiety, to wonder, to doubt, to desire, are states which the student must ignore. *Ordinary attention is liable to these very freaks, and passes beyond them by dint of intelligent practice.* Average individuals go about their affairs without becoming morbidly self-conscious and agitated. In a similar manner, agitation in self-observation argues the apprentice eye. We must become accustomed to turn inwards with as little ado as when turning outwards.

Let us leave generalities. As I am writing at the present moment I do not, as far as the writing is concerned, in the slightest measure feel excited or confused. If I shut my eyes, as I have done just now, the writing ought to proceed with no more transformation in the process than is implied in the absence of sight. Any excitement or change in the attention is of the evil one, and the most delicate instrument should scarcely record any modification. Mechanically the eyes are closed, and mechanically we proceed. After some practice it should be difficult to tell which out of a number of short lines were written with eyes closed or eyes open.† On the intellectual side, too, the severest scrutiny should reveal only serene peacefulness. [*Repeat this experiment a number of times, and record results.*] Thus with walking. At any convenient moment I shut my eyes and walk along as if they were open. My thoughts also keep unchanged, and there is altogether no alteration except as regards the absence of sight and its results. Should I be self-conscious and find normal thought difficult, or should I detect that I am different, it would be a proof that my experiment has been a failure and that I require further practice. [*Test experimentally.*] Thus with eyes open, after due exercise, I attend to what can be observed as regards the process of walking: how I lift the legs, how I put them down, and the sensations connected with these acts. If I am thoroughly trained, there will be no normal feelings suppressed or added to, and there will only be noted what a perfect memory of the normal process would redevelop.

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* "Observation is not, like perception and sensation, something that comes to man of itself; witness the fact that there are countless numbers who never reach the point of observing the phenomona of outer existence" (Beneke, *Die neue Psychologie*, 1845, p. 15).

† Bain (*Senses and Intellect*, 1894, p. 348) incautiously observes: "When we make our signature without seeing it, the execution is very faulty." [*Test this.*]

All accounts which disagree with this, stamp the narrator as a beginner, for development or suppression of ideas should be entirely in our power. Having several times observed myself walking, and having written down the observations, I repeat the experiments with eyes shut. The closing of the eyelids, experiment has taught us, makes no difference. Walking for about ten yards in a perfectly normal frame of mind, I learn that my walk is not in the straight line which marks open-eyed walking. Attending to the reasons, with eyes closed, I find further confirmation of the same fact. How often, indeed, do we not talk in the most natural manner to our neighbour, while all the time observing the effect of our speech, or attending in addition to something else. Irrelevant modifications condemn the observer at once. [*Observe yourself while walking with eyes closed; try and practise varied distances, directions, speeds, obstacles, etc.*]

When we first attend to a habitual action there is a tendency to confusion. Thus, when I first attempted to do so deliberately—being under the influence of the current psychology—I felt convinced that it was impossible. Practice, however, soon disclosed the fact that nothing was easier. The student should be able to observe any habit of his to the minutest detail without interfering with the habitual action itself. There must be no change or confusion, and there need not be. With many habits it is easy to test whether attention thereto perceptibly interferes with the process. At all events, while at the beginning there is hopeless chaos, at the end the practised intellect detects no change. Some games illustrate this gemmation of the attention. Try to tap the table with one hand while stroking it continuously with the other, and do the first more quickly than the second. Or perform the experiment so that the chest shall take the place of the table. [*Repeat.*] In these instances, a little practice will demonstrate that what could at first not be done at all, can be done later on with ease. Redistribution of the attention over a limited area is alone necessary in self-observation, and can become as easy of accomplishment in the one case as in the other.

A favourite illustration of the drawbacks of introspection is that passion excludes calm self-observation; that, in short, you are either in a passion or you observe. Strange to say, the truth seems to lie in the opposite direction, for a passion is never a momentary fact, and is, by its nature, far-reaching in its bodily effects, while it hardly ever has complete hold on us. Since self-observation requires but a modicum of attention, there is nothing easier than to observe oneself when excited. For example, walking through the fields, it happens that I am startled by a covey of partridges suddenly rising within a few feet of me. Forewarned, I instantly pull out my ready note book and write down the various changes I undergo from the very beginning till the subsidence of the upheaval. Since I cannot write as quickly as I observe, it only requires repetitions of the exciting occurrence to embrace its many aspects. Again, for functional or other reasons, I feel in a boorish mood. There is nothing easier in this case than to sit for hours together, if one wished, writing down the exact condition one is in. Thus, however annoyed I am, I find no difficulty in analysing my condition. Wherever self-observation cannot reach, there analogy at once fills in the outlines. It would be tedious to pile up examples where verification is readily accessible. [*Examine, making use of note book, cases of surprise, mood and passion.*]

Introspection must never, unless deliberately required, change the relevant state of thought. I say advisedly "relevant," because *some redistribution must take place. Usually it will be sufficient, if our attention, say, to a mood, excludes the ordinary noises we should otherwise be aware of.* There is not a spark of truth in the statement that there is such a thing as "a state of mind" in the sense of an indivisible whole which constitutes the field of thought at any one time. We might as legitimately speak of "a state of Europe," meaning thereby that when some one in London has the toothache, every one everywhere else in Europe is profoundly modified in his whole being. The residual illicit effects of introspection, as of observation, may be ignored without any danger.

"Be normal," is one rule of self-inspection; "Be minutely observant," is another. Not only should we insist that the observer shall not interfere with the observed state; but it is also necessary that he shall train himself to observe the veriest trifles. He should give ever fuller and more accurate accounts of what he sees in thought land.

Much of what is called introspection is merely conscientious observation. It is the power of discovering all sides of a subject and unearthing what is hidden instead of heaping up instances to support stray notions. Not the difficulties of introspection, but the absence of method is responsible for psychological vagaries. Indeed, *the distinction between introspection and observation is not scientific, for the worlds of mind and matter are one in the final analysis.* (Ch. 8.)

6.—DETAIL AND GENERAL FACT.

In sec. 2 we condemned the free use of hypotheses, and we insisted upon an exhaustive study of detail. Yet a very little reflection shows that details may be collected *ad infinitum*, without furthering a science. It is easy to imagine a novelist making a life-study of Drink. He draws, perhaps, most harrowing or most amusing pictures. He gives us many situations and scores of divergent characters. One man is made generous by drink, another mean; one persists in giggling, another becomes morose; one is loquacious, another taciturn; one is made sleepy, another lively. The observable situations are also inexhaustible, and innumerable are the note books which one observer could fill with his observations of the concrete consequences of drink. There is, perhaps, no crime under the sun which is not chargeable to it, and hundreds of thousands of homes have been turned by it into so many hells. Yet any conceivable array of books treating of these concrete facts leave the scientific observer as such uninterested. He wants something else.

Particular facts, in science, are a means to an end. It is only because they help us to arrive at general facts, or simplified statements, as

Mach would say; that they are of importance, science being the shorthand of knowledge. Hence a collector is not necessarily a man of science, though a man of science is, of necessity, a collector. A student, then, who is a close observer and nothing else, is not on the scientific plane at all. His observation must serve a purpose. He must collect with some end in view, with the notion of attaining to, or helping others to attain to, general facts—facts which widely hold.

Let us again examine our typical drink problem. I wish to understand the nature of drunkenness. Preliminary to any generalisation whatever, I examine a number of instances, ignoring the general memory contents. In each case I pass by what is plainly incidental, and note what repeats itself under varying circumstances. I want as many facts as possible, so that any generalisations I venture on are quickly verified or checked. I also demand many diverging instances, so as to determine by an after-appeal to memory what is special and general. One evening—it is a bank holiday—I am returning to town by rail. [*Observe some such case.*] Opposite me sits a middle-aged man who is the worse for drink. As he holds the glass, his hand shakes; so his other hand trembles as he pours out some of the liquor. He puts down the glass in a position which allows it to tumble over at the first jolting of the train. He does not recollect where he placed the bottle a minute previous, nor who has the glass.

I am aiming in this typical example at general facts, at general antecedents. So, with exact details to help me, I begin. His hand shakes. Is he unsteady on his legs? Can he carry his body or his head properly? Is there any portion of his body which shows steadiness? I now draw up the tentative statement that every one of his movements lacks firmness. "What is the reason of it?" I ask, looking at the disgraceful scene. I decide that his muscles are affected owing to an abnormal state of the nerves. Reasoning must, in this wise, proceed from step to step in a graduated fashion. Naturally I first referred to the body and its parts. Having settled that portion of the whole man, I make another move. "How does drink affect his reasoning, his judgment, his vision, his sensibility, his memory, his powers of attention, his discrimination?" The progress from one part of the body to every one of its parts; from thence to one part of thought and then to every other, should be a fixed custom. At every stage the student should have general rules for his guidance. What, then, is the conclusion as to his brain? It is that, as in the body, there is a tendency towards fitfulness and prostration. And have the peculiar physical and neural states a common factor which shall account for their likeness? Most probably; the nervous system being generally affected, brain as well as body suffer throughout and equally so. The last query should, of course, also rise mechanically on all appropriate occasions. But what seems true of this person now, would it be generally true of him? And what holds good of him, does it hold good of every one without exception? And do only drunkards behave like that? And what is the precise point of drunkenness where such behaviour ensues? And what is the particular process by which intoxicants produce the result? And what practical conclusions can we draw? Every one of these queries should arise unerringly, and does so arise with the trained thinker. The method of eliciting general facts must not be left to chance suggestions.

We see now that while duly appreciating an intimate acquaintance with details, our aim nevertheless lies beyond them. Without abundant details we should blunder repeatedly. Suppose I know a drunken person. Every few steps he takes he makes a little jump; aware of his condition he wisely refrains from speaking; and occasionally he bursts into a towering passion. The little jumps, the taciturnity and the wildness, would never suggest that the whole of the nervous system is in a quite abnormal state. The longer I study such an instance by itself, the further I stray from the truth. A large quantity of varied detail is, therefore, an essential as a preliminary to reasonable generalisation. Again, the conclusions we deliberately arrive at are, in their nature, different from those of the market place. As in the first inquiry we had comprehensiveness exclusively in view; so here we aim directly at definite generalisation. Amusement, interest, prejudice, are naturally absent. We do not hazard reckless may-be's, which we do not take the trouble to verify; but we think of what is reasonable, and rigorously verify our conclusions. In this light the work done by the current psychology, still leaving aside the experimental school, resembles to some extent scientific procedure, as the crow with its few peacock feathers attached resembled a peacock. So blinded are we by an old tradition that we do not see the gulf which as yet separates psychology from the established sciences.

The method above described precludes "licentiousness in speculation," though it allows of "a reverent freedom." Such problems as the psychology of Western nations, the psychology of war, or the psychology of a certain man's character whom we for the first time meet, we shall of necessity pass by as being for the moment beyond us. Only that which requires limited attention can repay study. When the majority of elementary notions have been ascertained, we can, with boldness, as in physics, proceed to unravel larger and larger issues. Arrived at the stage when physchological material abounds, we may freely venture to put on the seven-league boots of speculation. At every point then happy guessing will be possible, and verification easy. Until that time sails into sight, we must pay almost superstitious homage to minute details and cautious generalisation.

7.—Systematic Observation.

We have seen that hypotheses or general speculation are of little use in a new science. We have learnt that introspection, normal and minutely observant, is the avenue by which to approach our subject. Lastly, we have tried to weigh the value of details. We shall now urge that useful observation must be systematic, or pursued according to a defined plan.

Sir Michael Foster's *Physiology* is a splendid illustration of the rigorous application of deliberate method. Take, for instance, the question of cutaneous sensations or feelings. An average individual, and also an average psychologist, accepts the popular conclusions as to touch, pain, and temperature feelings. He then aimlessly speculates concerning them. If he, perchance, as an act of supererogation, makes half-a-dozen special observations, and performs an experiment or two, he thinks he is worthy of admiration. Let us compare such a method with that referred to in Foster. By systematic observation *every* part of the bodily surface is explored, and that most thoroughly. In this fashion differences of sensibility of various parts to touch, say, are determined. The observations are repeated on the same individual and on others, and nothing is set down as generally true to which there attaches the faintest suspicion. Anxiously the slightest hint is watched which shall throw more light or which shall qualify the observations made. The examination is then conducted under new circumstances. Perhaps a part is diseased or insensible, and we note the differences. We also systematically increase or decrease the pressure. Then we experiment with a view to seeing whether direct contact with the nerves which convey skin or cutaneous feelings to the brain, yields the same results. As such contact gives rise to pain, and not to feelings of touch, we ask to what factors the different effects are due. Then we separate feelings of touch from feelings of pressure, temperature and pain. We, therefore, start a fresh series of systematic observations, more prolonged than the first series. In each instance every point of the skin is carefully and repeatedly tested, and the results are again put to the test as in the case of touch. We thus determine variations of different classes of sensibility, in the same individual under different circumstances, and in different individuals. We find that different parts of the body are much less affected than others by irritation; that touch alone is felt in some parts; that some "spots" are sensitive to cold alone, and others only to heat; that under certain conditions we may be sensitive to cold and not to heat, and *vice versa;* that, in short, feelings of touch, pressure, heat and cold, and even sub-classes of these, may be observed independently. (Foster, *Physiology*, part 3, 1897, ch. 2, sec. 9.)

In the above we have judgment entered in our favour, and directed against current psychological methods. Here is systematic and close observation, and cautious progress towards large generalisations. No proud hypothesis is postulated; but the careful investigation proceeds from step to step. Most of the results thus achieved, revealing as they do what is inaccessible to passing observation, are beyond the power of the keenest speculative intellect.

The student must particularly note the method, and apply it himself *always, without exception.* First, one portion of a problem should be studied thoroughly. Then, *we must remember that since what is true of one thing is not necessarily true of any other, observation must be extensive; that the very opposite may be true; that the same thing may be true of apparently unrelated things; that the same thing may not always be true to the same degree; that change of circumstances may make a crucial difference;*

and, with these facts in view, we must find out in what direction any discoverable differences may lie. Our scientific mood must be so familiar with these cross-questions, that no problem for solution should ever suggest itself without our being prepared and able to apply the most rigorous standards. One psychological issue after another should be attacked in this manner. Mere reflection or recollection, unconnected with detailed and systematic analysis, should not even be thought of. We must examine the thing itself to the minutest fraction, repeatedly, and under every variety of circumstance. *We must provisionally hold that the suggested solution is wholly or partly incorrect, that its opposite is true, and that it is true of other things also.* Only by strenuously applying such canons as tests and precautions, shall we be worthy servants of science.

I reproduced from Foster the interesting example of the nature of skin or cutaneous feelings. His *Physiology* is full of records of examinations as beautiful as that. It was thought at one time that the cortex, or rind, or surface of the brain was the seat of intelligence and volition. Observers had discovered, for instance, that on application of an electrode to a certain portion on the surface, a particular movement was initiated. The theory seemed proved until some one cut away the brain in slices, and found that the surface could be removed without doing away with movements.* Touching in an appropriate manner a certain area of the brain of the frog, an area very ill-defined, we learn that motion of the shoulder results. Touching other similarly ill-defined areas, we discover that every class of motion can be produced automatically. Having abundantly verified this fact in frogs under various circumstances, we proceed to examine pigeons, then rabbits, then dogs, then monkeys, and then men. In systematic order we examine animal life, and find that the irritation areas become more defined as we rise higher in the scale, being most defined in man. (*Ibid*, ch. 2, sec. 7.) It must be noted that the examination does not proceed at haphazard, and that often the placing of undoubted facts in a certain order tends of itself to elicit general truths.

Or consider again the example of brainless animals. A frog deprived of its cerebrum will only move when it is stimulated from without. Under such stimulation, if continuous, it will behave almost as intelligently as an uninjured frog. So profound is its want of initiative, however, that, if close round its body a circle be drawn with chalk, it will, we are assured, die on that spot without any attempt at movement unless stimulated. This statement must nevertheless be qualified, for the operation involved injury besides that intended. Immediate results, Foster *over and over again* urges, must be discounted. The "deficiency" phenomena are not likely to be pure at first, and the longer the animal lives after the operation the more important, therefore, become the observations. Hence we find that initiative, in the absence of any growth of the cerebrum, is, to some extent, restored when the animal has, after some months, completely recovered from "shock" and other irrelevant injuries. It is, therefore, proved that initiative is not solely dependent on the cerebrum, and that motion is also not exclusively connected with the cortex. Yet once more we cautiously climb up the animal ladder, and find that while injuries, as we ascend in the scale, become more and more immediately fatal, initiative grows more independent of the cerebrum. (*Ibid*, ch. 2, sec. 4.)

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* This experiment should certainly have been made at the first, if such experiments be allowable at all.

Take again the case of ingoing and outgoing, or afferent and efferent, nerves. Cutting through a bundle of spinal nerves, as we might cut through a rope, we notice that some degenerate and others do not. Those which degenerate downward, we are tempted to consider as fed from above, and, therefore, carrying messages upward; and those which degenerate upward, we consider as giving rise to movements and other changes in lower centres. However, if we carefully examine the matter by the methods which we have insisted upon, we find that the problem is by no means so simple. It seems as if there were relays of nerve fibres; then fibres—internuncial or commissary—which connect the various parts of the spinal cord horizontally and longitudinally; and, lastly, stimulation may proceed physiologically along the grey matter. Instead of single nerve wires connecting skin with cortex and cortex with skin, Foster continually insists that the true process which ends in motion and sensation, is one of complex elaboration, utterly unlike the single wire system which we have assumed. (*Ibid*, part 3, passim.) Here, again, we learn the folly of paying heed to large hypotheses, and the absolute necessity of proceeding by systematic examination. A child could make as good a guess at the nature of the Himalayan flora as we at the nature of cerebration or thought.

The preceding references to Foster's *Physiology—which must also serve as a very brief account of the more important facts of brain physiology*—have made clear what we mean by systematic observation. However, the student of psychology must not only know, but be skilled. He must methodically learn to apply what he knows. It would be well for him to practise on a large scale, unless he has done so already. For instance, to start with extra-psychological examples, he might, from minute observation, give the completest general account of which he is capable of the history of a dandelion or any other flower he chooses, from the moment it is discovered above ground to the time when the wind has scattered the seeds. He should examine samples in all sorts of places, high and low, shady and sunny, cold and warm, wet and dry, windy or sheltered, at different times of the day or the season, and in various soils. Every kind of variation should be noted; and, if time permits, comparisons might be made with like and unlike species. [*Its large size and its interesting transformations make the dandelion peculiarly suited for study.*] Or the student might be inclined to write an essay on stamens and pistils, on sepals, on corollae, on leaves, and the like. A limited task, efficiently carried out, is the ideal for practice in general skill; an intricate problem is beyond the beginner. Or the student may watch a thermometer, a barometer, or the movements of the sun, the moon, the wind, or the clouds. Or he may take account of the transformations which one particular bush undergoes in a twelvemonth, and possibly generalise tentatively at the same time as to our common flora. As explained more especially in sec. 136, he will examine concrete facts; he will choose a simple problem and give his whole attention to it; he will proceed methodically, and reason as boldly and as systematically as his facts allow.

I have referred to brain physiology, botany and some facts in physics. The application to psychology is no less in place. The study of a science whose facts we merely store as we usually do the data of geography, does not cultivate the judgment: *physical science thus taught is not to be compared in its effect with the benefit derived from a classical education where skill is constantly required in the interpretation of an author.* In psychology, too, the appeal must be to the student's judgment rather than to his memory.

Let us examine some psychological problems in the light of the principles I have endeavoured to expound in this section. Everybody knows, we are told, what is pleasure and what is pain: they are elemental facts which admit of no explanation. Apply now the rules of investigation which have been referred to. First, we go to the facts. We do not recall illustrations, which might or might not be the result of bias; we observe at first hand. Observation, again, must not be without guidance. We observe pain after pain in mechanical succession; every pain as it occurs; and not only one here and there, where subjective selection may play some part. We observe for as long periods together as possible. Our experiments are as minute and as guarded as were the experiments about skin sensations already dealt with. We notice kinds and degrees of pain, and try to define them accurately. We learn what are the most regular accompaniments or signs of pain. We compare our painful states with other states where pain appears to be absent or pleasure present. We are on the look-out to see what pain has in common with other states, such as sensations, emotions, feelings of doubt or touch, inclinations or disinclinations, habits, and effort. Of all our observations we keep full notes. As facts repeat themselves, so we tentatively, but none the less boldly, suppose them to be general facts.

At last no new classes of facts seem to come forward, and to go on, is to be thrashing chaff. We proceed now to set down those features which were repeated oftenest, and we arrange our material, with our tentative minor conclusions, systematically. Is it then true, we ask ourselves, that in pain we always tend to turn away from the object which causes it, and that in accordance with the degree of pain? And is it correct that in nothing else do we tend to turn away from an object? Is pain an elementary fact, not to be defined, always recognised with certainty as soon as met with, and never confounded with anything else? The answers to these questions the student will find in ch. 6. Here I insist that even a tentatively correct reply must be based on an examination such as I have fore-shadowed. Observation must be systematic and exhaustive if we are to offer any solution at all. No new problem is so simple that method can be dispensed with.

Let us take another case. James tells us that in certain critical instances our conscious wills can, by means of a special effort, add to the sum of physical energy existing. Just as a flash of lightning comes from cloudland, so occasionally a bottle of extra energy is poured into the stagnant world pool.* What is effort? we ask ourselves, and proceed to observe systematically every kind of effort. We examine methodically phases from the clearest to the vaguest, from the most obvious to the least obvious. On every possible occasion, and under every conceivable circumstance, we attempt to trace its origin, its nature and its effect. We note how far its own states resemble one another, and how far these resemble other states which are not usually classed as efforts. We observe how far they universally prevail, and how far there are other forces. Having conscientiously examined the material, we pronounce judgment either for or against James. At the same time we have probably been able to find a more or less permanent niche for that phase of thought which we call effort. Examination of facts is absolutely essential: the cleverest reasoning in its absence is only a jugglery with words; the most neatly written essay, with its firstly to Xthly, is as unsatisfactory as an imaginary fortune. All the quoted arguments against introspection have no more solidity than the reflection of a fortress in a looking glass.

Every one of the questions treated of in this volume should be examined systematically. "I can, therefore I must," is even more imperative in scientific inquiry than in moral conduct. When it is asserted that attention is a casual process (ch. 2), or that action may be divided into habitual and non habitual (ch. 3), or that ideas are of such and such a nature (ch. 4), or that conscious process should be divided from not conscious process (ch. 8), we must in each case fall back on our first principles of investigation. When once a number of problems of crucial importance has been disposed of, sufficient facts will have accumulated to allow of a quicker procedure in psychology. Until then, oceans of ink imprinted on balls of paper as big as the sun, will not advance psychology. The scientific method varies in kind from current psychologising, and hence the two are incommensurable.

In connection with every problem or assertion, the student must have recourse to systematic observation. He should put a query against every psychological statement, however emphatically put forward. He must let no supposed truism pass, and no maxim or axiom should be left unchallenged. Fiction has often been so cleverly attached to fiction that the student is likely to be deluded into seeing an imposing edifice where there are only bits of coloured glass. A true generalisation is soon verified.

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* So also Ward, *Naturalism and Agnosticism*, 1899.

8.—QUANTITATIVE PSYCHOLOGY.

The senses of sight and sound have long been favourites with physicists. In Germany, Helmholtz, and in England, Tyndall, are best known as having devoted some of their genius to the task of resolving problems of this class. Physiologists, in the same manner, have not been remiss in dealing with the instruments of sensations. I have already referred (sec. 1) to the speculative attempts of Maudsley and Lewes, among others, to interpret thought in neural or brain terms. Further investigations since their time have been satisfactory, but extremely slow. The perusal of a work such as Foster's (*Physiology*, part 3, 1897), or Ferrier's (*The Functions of the Brain*, 1886), leaves one with the impression that the possibilities are great, but the results small. The neural facts known, form, as yet, an insufficient basis for any wide conclusions. However, it is in neurology, or brain science, coupled with introspection, that our hope ultimately lies. Psychology, jealously separated from physiology, as we shall abundantly see in the following chapters, cannot supply us with a consistent account of the facts of mind.

There was but one step from probing sense problems to exploring quantitatively some of the simpler sensations and images. Following Fechner, Wundt, about a generation ago, in a large work, *Physiologische Psychologie*, was the foremost in popularising such inquiries. His laboratory in Leipsic became a centre of interest and the type of many which were to follow, till now both Germany and America boast a number of psychological laboratories. Since Wundt's time, also, books on the subject have been on the increase, whilst a multitude of articles and essays have seen the light. Such publications as *Philosophische Studien*, *Zeitschrift für Psychologie*, *The American Journal of Psychology*, and *The Psychological Review*, are largely devoted to the interests of Quantitative Psychology or Psycho-Physics.

The object of the quantitative school is to examine psychological facts experimentally. For this purpose laboratories are fitted up, containing the necessary appliances. All the customary scientific checks are employed. The number of experiments is recorded, as well as the number of persons experimented upon. The time taken by each experiment is determined by electric clocks which generally mark thousandths of a second and which are usually stopped by pressing a button on which the hand already rests. In short, these experiments are distinguished by an ingenuity and a care which is scarcely exceeded in physical inquiries.

We cannot determine the current of thought by withdrawing or adding to it half-pints or spoonfuls, nor can we yet ascertain the length of a string of ideas with a tape measure. Psycho-physicists, therefore, approach their subject tentatively. Here is a simple experiment. It is arranged by a mechanical device that a sound shall be heard or a sight seen by one prepared for the task. The subject of the experiment or, shortly, the "reagent," as soon as he hears or sees the special signal, stops the electric current which his fingers control. By repeated experiments with many persons we gain at last the knowledge of what average time elapses between a sound or a sight and its apprehension. Following scientific method, we find accordingly the experiments varied, account being taken of different ages and races, different times of the day, and different seasons. So also the reaction time is determined when the "reagent" is smoking or under the influence of intoxicants, or hashish or morphia. Each of these sets of experiments is carefully recorded, and naturally presents great difficulties. What is true of sight and hearing holds, of course, of the other senses, including pain and the so-called muscular sense.

Mere recognition of what is expected is the simplest form. The sensations are now tested as to their intensity (or obviousness), and especially as to the smallest added degree of an impression which is immediately perceivable; or the effects of fatigue are studied in this connection; or we learn how far a preceding sound affects vision, and *vice versa.* Assuming that we have exhausted repetition, obviousness, quickness and circumstance, we proceed to more complex experiments. The "reagent" is told that it will be either a colour *or* a sound. Here the preparedness is divided between two possibilities, and the results are noted. Then the changes are rung on this set of experiments as on the preceding set.

We come next to more extensive discrimination experiments. The "reagent" is informed that he is to tell the capital of any country that may be named. Or he is asked to tell the country when its capital is given. Or he is requested to give the name of a great man, a great poet, a great painter, when he is asked. In each case the "discrimination period," the time it takes to discriminate, is determined. Obviously, experiments in this direction admit of endless complexity, and become progressively more difficult.

Experiments are of various kinds. A number of writers have sought to determine the sleep curve, *i.e.*, how far during the night the depth of sleep varies in an average individual. Ebbinghaus, again, made experiments with nonsense syllables, so as to determine, in its purity, the nature of memory (sec. 135). So Miss Calkins has carefully tabulated the facts of a series of over three hundred dreams (sec. 228), while various experimenters have made a variety of experiments to elucidate the process of attention (ch. 2), the capacities of school children, and racial differences.

I welcome the quantitative method as such. If it can best elucidate the problems of psychology, it must take the first place. One does not know what it may accomplish in the future; but up to the present, after a generation of toil, its many solid achievements have scarcely touched the borders of psychology proper. It has thrown no light whatever on any of our chief problems. It deals with borderland affairs which apparently yield no glimpse of the far interior. The facts of psychology seem so varied that once psycho-physicists forsake the frontiers, endless discussion instead of fruitful research ensues. It is perhaps the absence of continuity in the investigations that is to blame. Experimenters take up subject after subject, when perhaps some years spent by one person in studying one aspect, such as memory, attention or dreams, might end in valuable contributions. Another fault lies undoubtedly in the too ready acceptance of the chief propositions of reflective psychology. Associationism is tested as if it only required exemplification or correction, and attention theories are unsatisfactorily dealt with in the same manner. The quantitative method itself is overdone. Ebbinghaus' huge inquiry as to memory (sec. 135) settles practically nothing. The simple factors he experiments with—nonsense syllables—no more give a satisfactory solution than an examination of pinches of powdered bones would yield the key with which to unlock the secrets of the central nervous system. In my opinion a broad-based inquiry into what we actually do remember and forget, and the circumstances which favour the one and the other, would have yielded more promising material. So also with the question of dreams. To tabulate dreams according to the hours when they are supposed to have occurred, to divide them into reasonable and unreasonable ones, to tell us what relations and persons were seen, as Miss Calkins does, is to supply us with meaningless figures. Giessler's detailed non-quantitative analysis towers far above such mechanical figure-work. Finally, as to Thorndike's very interesting experiments with animals (sec. 233), we may observe that valuable as are some of the results, suggestive as are others, yet the restricted method employed entailed as many fallacies as a non-quantitative analysis in that direction. Nearly every point is vitiated by the absence of an appropriate background of general fact. Much again rests on indefensible assumptions which the inquiry hides rather than exposes. A few months' careful observation of a healthy ape, or, in default, of an average dog and cat, should have resulted in wider and less disputable conclusions. Lastly, when we come to directly observed trains of thought, the quantitative method sheds no light whatever. A book, such as Scripture's, makes us feel that psycho-physics will not have the last word to say in matters psychological; and Wundt's latest edition of his large Psychology only confirms us in our conclusions.

On examining the psycho-physical literature two failings become specially prominent. There is a superstitious belief in the magic of figures, a belief not to be found in the physical sciences.[*] To an outsider it seems that judicious observation and chance experiment could settle with comparative ease many of the questions which demand mountainous labour from the figure school. Or we may say that instruments would be better used after other methods have prepared the way. At all events, the second failing illustrates the first. Psycho-physicists are now insisting that figures, uninterpreted by the state of mind of the "reagent," are not to be relied on. We are thus completing a circle. *First, men rushed to figures because introspection seemed unreliable; and now self-observation is*

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[*] "I highly esteem figures which prove something or which can be utilised theoretically; but I am at a loss to understand the special dignity which figures and rows of figures possess in the eyes of some men" (Lipps, *Grundtatsachen*, 1883, p. 421).

demanded to give a meaning to the figures. Systematic introspection must, therefore, ere long, be generally acknowledged as essential to psychologising.

We conclude, then, that there is still room for a method different from that of the speculative or the quantitative school.

After reviewing what is practically the whole field of psycho-physics, my misgivings as to its value have grown stronger than ever. The method seems fundamentally wrong. A problem is posited, reduced to its simplest form, and then rigorously tested. It appears to me that the simplicity is in every instance non-existent. It is a hypothetical simplicity, a simplicity suggested by surface knowledge. The primary facts of a science, I cannot help thinking, must be obtained by tentative and resourceful trials, and are not obtainable by stiff laboratory experiments.

The two chief works of the quantitative school are Wundt's *Grundzuge*, 1893, and Munsterberg's *Beitrage*, 1889-92. A simple exposition of psycho-physics will be found in Scripture, *The New Psychology*, 1897. See also Bain, *Introspection and Psycho-physical Experiment*, 1893; Bettmann, *Beeinflussung einfacher psychischer Vorgange*, 1895; Binet, *La Mésure en Psychologie Individuelle*, 1898; Cattell, *The Psychological Laboratory at Leipsic*, 1888; Cattell, *Mental Tests and Measurements*, 1890; Cattell, *Mental Measurement*, 1893; Fechner, *Elemente der Psychophysik*, 1860; Heinrich, *Physiologische Psychologie*, 1899; Henri, *Les Laboratoires de Psychologie Expérimentale en Allemagne*, 1893; Scripture, *Psychological Measurement*, 1893; Titchener, *The Leipsic School of Experimental Psychology*, 1892; Titchener, *A Psychological Laboratory*, 1898; Titchener, *The Equipment of a Psychological Laboratory*, 1900; Titchener, *Experimental Psychology*, 1901; and Wundt, *Ueber psychologische Methoden*, 1881.

9.—EXPERIMENTAL INTROSPECTION.

The experimental method is rightly esteemed to surpass the method of simple observation, for there is something exhilarating in grasping the gate of time, and swinging it to and fro at our pleasure. In observation we have to wait months and years to observe a fact, when in experiment we can often produce it as soon as thought of. In observation we are dependents whose desires may never be satisfied; in experiment, we are masters whose word is decisive. Wherever, therefore, experiment can be applied, it will be folly to continue with simple observation, the latter being to the former, as "moonshine unto sunshine, and as water unto wine." An observational science is, for these reasons, generally viewed with suspicion, while the use of experiment adds dignity and inspires confidence.

What marks an experiment? Professor Titchener says: "An experiment is a trial, test, or observation, carefully made under certain special conditions: the object of the conditions being (1) to render it possible for any one who will to *repeat* the test, in the exact manner in which it was first performed, and (2) to help the observer to rule out disturbing influences during his observation, and so to get at the desired result in a *pure* form . . . Experiment thus secures accuracy of observation, and the connection of every result with its own conditions" (*Outline of Psychology*, 1896, p. 35). This definition strikes one as unsatisfactory. It savours too much of the psychological laboratory. It resembles dangerously those definitions of religion which, by implication, prove that our petcreed has no rival. It would be safer to say, "An experiment is a trial, test, or observation, carefully made . . . . so [as] to get the desired result in a *pure* form." This again sounds vague. Stout's definition is no more satisfactory. Experiment, he says, "is only observation under test conditions, deliberately pre-arranged for the purpose of settling a definite question" (*Manual*, 1898, p. 26). It seems that one may vary conditions at will without having deliberately pre-arranged anything and without one's having in view the settling of a definite question. For instance, in pulling hard at something firmly fixed I notice that I hold back my breath. In accordance with customary method, I try to pull hard while breathing normally. Here, instead of waiting for an opportunity, I create it. In that—in the creation of an opportunity, or in varying and controlling the conditions—lies probably the nature of experiment. Stout's definition applies only to special experiments; since even many of the quantitative attempts start without hypothesis. Most probably, there is no clear line of division between observation and experiment. As the former becomes systematic and varied, so it approaches the nature of the latter.

Experimental introspection is not a subject usually discussed in treatises on psychology. When we are told that self-observation is an absurdity (Comte and others), or that we must become skilled if we are to take a momentary glance at what is happening (Hume and others), it follows that experiment is out of the question. Herbart, indeed, takes high ground. He tells us that "psychology must not experiment with man" (*Lehrbuch*, 1834, p. 9). Is then experimental introspection impossible or impracticable? We have seen that attention to selected portions of the field of attention is possible to a high degree. Does then the creation of an opportunity, instead of waiting for it, introduce a fatal, disturbing factor? Observation replies in the negative. It was as easy to allow breathing to proceed normally in the "pulling" experiment, as to do anything else which one is not accustomed to. Experimental introspection, in short, has certain advantages, but no appreciable drawbacks. As Beneke puts it: "Nothing is falser than the assertion that introspection cannot be assisted by experiment. Not only is such assistance possible, but it offers here perhaps greater scope than in any other department of nature, and that because the necessary control is generally more in our power" (*Die neue Psychologie*, 1845, p. 21).

Everybody recognises the superiority of experiment over simple observation. The student must, therefore, be prepared to learn that *in psychology every inquiry* MUST BE EXPERIMENTAL. Simple observation is only permissible when, for peculiar reasons, experiment is undesirable or out of the question. The normal procedure, the all but exceptional method, must include experiment.

The reader will see that in sec. 7 I applied systematic observation to the elucidation of the problems of pleasure, pain and volition. According to the last ruling, these inquiries should be experimental. Take the question of pleasure-pain. Instead of waiting, like wall-flowers in a ball-room, we take the initiative. We deliberately heat a glass and gauge our feelings with the changing heat. We deliberately and repeatedly touch the marble or iron on which the sun is striking with its beams. We go to the fire and expose ourselves to its heat, in order to test our powers of resistance, and ascertain the changes in our sensations. We deliberately cool one hand and warm the other to test the relative aggressiveness and diffusion of the feelings of cold and warmth. We pinch our hands till they ache, etc., etc. Thus there is the fullest room for experiment since we need not wait for chance opportunities. We compare experimentally various sensations and feelings with one another, and examine their degrees, their resemblances, their differences and their conditions. We deliberately ignore a so-called feeling of pain which we have deliberately inflicted, or attempt to reduce or increase the pain value by inhibition or by removal of inhibition. In psychological experiment we thus control the conditions, and test our conclusions at our own discretion. Results can in this way be attained which otherwise might scarcely be approachable.

As with pleasure-pain, so with volition experiments. In systematic observation there is only a preparedness to perceive or record facts of a certain order as they arise. In systematic experiment we act on our preparedness: we summon the actors to the footlights.

Instead, therefore, of waiting for volitions to occur, we initiate them, and we also purposely watch whole trains of our actions for any signs of volitions. We deliberately will, and in doing so we make an effort to trace the antecedents of our volitions. If a sensation of sight is perhaps connected with the act, we endeavour to eliminate it, or even instal in its place an irrelevant sight sensation. One after another, we push rudely aside every factor which admits of being so treated. We measure the relation between will, effort and action, finding perhaps in some instances that they have nothing in common. We see whether there are similar states to that of volition, and experimentally test the relationship. In a like manner we examine our volitions during joyous or depressed moods, when we are in robust health, or when we are ill or fatigued, and under other special circumstances. After such an inquiry, and only after such an inquiry, we may be able to agree with Professor James, or to differ from him. To meet his gratuitous assertion, based on a temperamental view, with one equally gratuitous and temperamental, is to forget that experimental introspection should be the final arbiter. A temperamental psychology is as irrational as a temperamental chemistry.

The rules which we have selected for guidance in systematic observation apply here. An experiment, not protected by method, is a poor instrument of research. Experimentation is an art with canons to be observed, and not the equivalent of the method employed by a careless child. Merely to shift things and to break them, is something different from experimenting. The student must, therefore, see that his experiments are conducted on a proper plan, and that they are accompanied by "normal" and "minutely observant" observation (sec. 5).

As I have already indicated, the student should pursue his studies experimentally. To assist him in this, I have inserted in the body of the book italicised remarks in brackets. Every statement of any importance should be at once challenged and tested, or if testing be sometimes inconvenient, the statement should be marked as doubtful. There must be no acquiescence When experimental introspection has been pursued by many, then, and not until then, can statements of any kind pass unchallenged [*Note that all complicated and violent experiments defeat themselves*]

I suggest the following experiments or observations, and must remark that repetition under varying circumstances is necessary, and that notes should be taken at the time, of what is observed. Write mentally in characters of various sizes; so also employ mentally printed and sounded characters. Use lips as in vigorous speech, without making any sound, and also observe the various organs employed in speech. Picture to yourself squares, triangles, etc, of various sizes. Observe eye movements in seeing, also movements in walking, running, working, etc Examine mentally form, detail, as many colours as possible, shades of colour, relief, scenes, motion of eyes in watching moving objects. Hold steadily pencil, pencils, etc., in hand, behind the ear, etc, and note result. Recall various smells of things just smelt, lately smelt, and smelt long ago. Describe bodily feelings in sitting (in various positions), standing, walking, etc., and describe what you feel, passively and actively, of feet, legs, back, arm, head, teeth, tongue, separate fingers, etc. Recall in succession relatives, intimate friends, acquaintances, celebrities, movements, houses, cities, events, villages, flowing rivers, mountains. Recall young people, old people, poor people, rich people, and other classes of persons. Write letters, etc, in the imagination, and watch for eye movements; connect thus sounds with the ear, smells with the nose, tastes with the mouth, movement with the muscles, etc. Write, speak, move, distinctly in the imagination, and note rate of progress Think of two or more colours at once Think of coloured things, of sounds, tastes, smells, touches, pains Mentally see things moving; see two things moving in different directions. Think of yourself moving along a room, passage, stairs, hall, street, etc; also measure distance and time, by feet and seconds. Observe mentally and in motion, train, cab, cart, bicycle. In mentally writing, do you see arms, hands, fingers, pen, paper, characters; do you feel pressure on pen, and do you hear the scratching of the pen? Imagine man, cow, horse, etc, as blue, green, violet, pink, scarlet, etc. Look at some pebbles, etc.; then see whether you can count them mentally. Hear with one ear, both ears, far and near, much and little, different kinds of sounds. Examine degrees of cold, warmth, touch, soft, hard, rough, smooth, pushing, pulling, effort.

Each of the experiments suggested above should be made in the light of the rules laid down in this Introduction. Barely to observe this or that is of no use at all.

10.—DEFINITION.

Volkmann (*Lehrbuch*, 1894, i, p. 1) says that the success of every scientific enterprise is essentially conditioned by the accurate definition of its aim. On this hypothesis, which is in accord with the current respect for hypotheses, the writer of this work should have had his definition cut in adamant before starting his inquiry; but, as it happens, research and not hypothesis, determines its contents. Only subsequent to the arrangement of the data is there a possibility of venturing on a definition. The latter embraces the most general facts, and only after we know these is a summing up possible. It is, therefore, not surprising that the definition here put forward, began only to be framed after the ten chapters which follow were completed.

My definition, tentative in its way, is as follows: *Psychology treats of the nature and the satisfaction of those distinctive needs which are connected with the central nervous system, and this it treats of in systematic conjunction with the systems of sights, sounds, smells, etc., which are developing concurrently, i.e.,* psychology treats of the needs which arise out of the relations of the various systems in the organism, and out of the relations of that organism to its environment (sec. 156). The book itself is the most concise explanation of the definition which can be offered. The student will find therein why needs play the part we have allotted to them, why the central nervous system is here coupled with sights, sounds, etc., and why the nature of needs and the method of their satisfaction is the be-all and end-all, the base and the summit, of psychological inquiry.

11.—LITERATURE OF THE SUBJECT.

The text of the ten chapters which follow, leaving out of account most of what appears in small type, was written away from, and, humanly speaking, independent of books. It was only afterwards that the usefulness of literary references occurred to me. Accordingly, I determined to make a survey of the whole field of psychological literature. Let me begin by stating what I shall not treat of in this volume: (1) Everything pertaining to, or bordering on, philosophy, including free-will controversies; (2) most of what is related to physiology and the study of the special senses; (3) the mass of that which refers to experiments in reaction time, to the psycho-physical law, and the theory of innervation; (4) nearly everything specialised, such as the psychology of music, or painters, or races; and (5) abnormal psychology, such as is implied in studying insane and hypnotic subjects and cases of aphasia. Those are the studied omissions. On the other hand, I have attempted to include (1) all the principal psychologists; (2) all the writers of special treatises, such as on memory, attention, etc., which I could obtain; and (3) all the articles in reviews which had a bearing on the subjects dealt with in the body of the book. The reviews consulted, from the first issue to the end of 1900, or to the last issue, are as follows:—*American:* American Journal of Psychology; The Psychological Review; The Philosophical Review; and The Journal of Speculative Philosophy. *English:* Brain, and Mind. *French:* La Revue Philosophique, and La Revue Scientifique. And *German:* Philosophische Studien; Zeitschrift für Psychologie und Physiologie der Sinnesorgane; Psychologische Arbeiten; Pflüger's Archiv für die gesammte Physiologie der Menschen und Thiere; and Vierteljahrsschrift für die wissenschaftliche Philosophie. In this manner, students will find *almost a complete bibliography* of such subjects as Attention, Habit, Association, Memory, Feelings, Dreams and Genius.

12.—PSYCHOLOGICAL TERMINOLOGY.

In this Introduction I have employed the current psychological terminology. In the sequel, however, it suggested itself as best to introduce, without labouring the matter, a terminology which shall be simple, free from misleading implications, consistent, impersonal, and which shall reflect the systematic conclusions we reach. At the same time I have, by re-defining, been enabled to retain many of the well-known psychological expressions.

The terms chosen indicate degrees of systematic complexity, and nothing besides They are, therefore, descriptive of the facts, without carrying with them extra psychological implications. Furthermore, the words are well known, easily adapted to psychology, readily admit of prefixes and as readily form adjectives and verbs. The precise meaning given to the terms requires nevertheless some explanation. (1) The word *System* indicates that psychology, like physiology, deals with determinate complexes, and only with such. (2) The word *Integral* expresses the lowest form dealt with by psychology; it indicates the simplest whole, a sensation or an image. Integrals are for us the elementary units or integers of thought and action. (3) The word *Compound* leads us a step further. We have here two or more integrals in intimate union, as in perception. (4) The word *Complication* marks another form of systems. Here two otherwise unconnected primary or (and) secondary systems appear together, as when the sight of a fire engine is always or generally accompanied by the re-collection of a certain conflagration. (5) The word *Connection* suggests that with any given system is connected some other system, connection being another general word for consciousness, awareness, knowledge, ignorance, belief, doubt, certainty. (6) Lastly, the word *Combination* hints at a combination of systems as in a train of thought or action, and it may be divided into sub combination and super-combination, the former referring to partial needs, and the latter to the principal need at any time.

Useful as the above terms may be, they are yet too vague from a scientific point of view; for the meaning underlying any one of the terms underlies all others to some degree. Hence we may, as in sec. 107, describe the rising complexity spoken of in terms of units of various degrees. However, there can be no disputing that the words do reflect increasing complexity.

The prefixes employed are of some importance in showing diversity within unity, and also in preventing too bulky a vocabulary. As to their appropriateness, much may be said for and against. It is assuredly useful that thought and action, memory and activity, should be readily distinguished or combined, and this the prefixes do. Since in thought there is no new material, we are justified in systematically applying the prefix *re*, indicating recurrence, to all its phases. And, by contrast, it is not a far stretch to employ the prefix *pre* to point to those systems which are new, *e.g.*, as we say, arrange, pre-arrange, re-arrange, so we say, combine, pre-combine, re-combine. To indicate imagination and work, we may, in addition, employ the prefix *trans*, thus trans-combine (primary or secondary action), trans-pre-combine (work), trans-re-combine (imagine).

The general problem of a psychological terminology is far from simple. On reflection one finds that *our whole vocabulary reflects the psychology of the past, and that*, therefore, *nothing less than a total reconstruction of human language can satisfy rational demands.* Such a revolution, not an unlikely one, must be, however, the work of centuries and not that of a solitary individual. Suffice it, therefore, that an attempt has been made at linguistic reform and interpretation.

Descartes is responsible for the notion that we must see that our ideas are *clear* and *distinct.* Perhaps on account of the *turbidity* and *indistinctness* implied in that rule, the cry was re-echoed everywhere, Locke being the principal sinner in England. The question of terminology is fully discussed by Tönnies, *Philosophical Terminology*, 1899. My own opinion is that a close study of a subject, together with a desire to a mutual understanding among experts, are the chief pillars of a solid terminology. When all is confusion, as in present-day psychology, one smiles as one hears complaints against the varied ways in which words are used. Here are Descartes' four rules, which will repay careful study: "The first rule was never to receive as true anything which I did not demonstrably recognise as such; that is to say, to carefully avoid precipitation and prejudice; and to include in my judgments nothing which did not present itself to my mind so clearly and distinctly that I had no occasion to doubt it. The second rule was to divide every difficulty under examination into as many parts as possible, or into as many as might be necessary for its solution. The third was to conduct my thoughts in an orderly manner, by beginning with the simplest objects and those easiest known, slowly rising by degrees to what is most complex, and postulating an order even among those objects which do not at all naturally follow one another. And the last rule, to make such a complete induction, and to take such a comprehensive view, that I might be sure of having omitted nought" (*Discours de la Méthode*, 1637, second part). See Gibson, *Regulae of Descartes*, 1898.

System.—Anything given whatever. [To develop].

A. Primary system.—Any system referable to the Present. [To pre-develop.]

B. Secondary system.—Any system referable to the Past. [To re-develop.] [In the place of *pre* and *re*, primary and secondary can be used.]

A and *B* are again divided into—

C. Integral [system], where a system is considered apart from any interpretation placed upon it, as when a coloured surface is seen, without being connected with (say) the name of an orange or a lamp. [An integral, or a sensation or image; a pre-integral, or a sensation; a re-integral, or an image. To integrate, or to sense or image; to pre-integrate, or to sense; to re-integrate, or to image. Integrate also equals to member, to collect.] [Thus also de-develop, dis-integrate, etc., equal to forget.]

D. Compound [system], where the opposite to *C* takes place, as where a certain coloured surface has attached to it the name of a hat or a desk. [A compound, or a percept or idea; a pre-compound, or a percept; a re-compound, or an idea. To compound, or to perceive or ideate; to pre-compound, or perceive; to re-compound, or ideate.] [Combination unit or unit = the unit in a train of thought or action.]

C and *D* are again divided into—

E. Elementary [integral or compound] system, wherein is included every system, except visual, auditory, olfactory and gustatory systems. [A feeling, elementary sensation, elementary image, etc. To feel; to develop an elementary sensation, etc.] [Summary feeling = the impression an event makes on us. Combination feelings = feelings, such as are implied in doubt, belief, etc.]

F. Semi-advanced [integral or compound] systems, wherein smell and taste alone are included. [Semi-advanced sensation; image, etc. To develop a semi-advanced sensation, image, etc.]

G. Advanced [integral or compound] system, wherein only sights and sounds are included. [An advanced sensation, image, etc. To develop an advanced sensation, image, etc.]

A to *G* have as a sub-form—

H. Transformed systems, embracing illusion, delusion, imagination and all productive activity. [Illusion; delusion; imagination; production; etc. To be illuded, to be deluded, to imagine, to produce, etc.; or to trans-integrate, to trans-compound, etc.]

I. Complication [of systems], as where two sensations or two images, or a sensation and an image, or any two or more systems, are connected together to form one whole, *e.g.*, when treating of a conflagration I am always reminded of a particular conflagration which I had been a witness of. [A complication; a pre-complication, a re-complication. To complicate; to pre-complicate, to re-complicate.]

K. Connection [of systems], as in consciousness, awareness, knowledge, belief, doubt and certainty, where something is connected or linked with something else. [A connection, linking, or chaining. To connect, to link, to chain.] See sec. 99b.]

L. Combination [of systems], *i.e.*, a train of thought or action. [A combination, or thought or action; a pre-combination, or action; a re-combination, or thought. To combine; to pre-combine, or to act; to re-combine, or to think.] [Combination unit or unit = the unit in a train of thought or action.]

M. Exhausted system, *i.e.*, an object or a notion as interpreted in the light of fullest knowledge, *e.g.*, a seen clock and all that that implies, a felt love and all that that implies.

N. Unexhausted system, *i.e.*, an object or a notion as immediately given, and apart from all inference, *e.g.*, a clock as just seen, a love as just felt.

O. *Need* = absence of functional stability. *Satisfaction of a Need* = the process of regaining functional stability.

P. *Change in systems as need-determined.* [Need-determined change, or functional adjustment. Thinking; acting.]

Q. " " *self-determined.* [Self-determined changes. Aestheticising, imagining, playing.]

R. " " *distributed.* [Attention; pre-attention; re-attention. Attend; pre-attend; re-attend.]

S. " " *disturbed.* [Disturbance, or pleasure-pain; opposed disturbance, or pain; semi opposed disturbance, or pleasure; pre-disturbance, or immediate pain, etc. To disturb; to pre-disturb; to re-disturb.]

T. " " *organised.* [Habit, organised reaction, trend, economisation. Organisation; pre-organisation, re-organisation. To organise; to pre-organise; to re-organise.]

U. " " *excited.* Acting under excitement. [Excitement; pre-excitement; re-excitement. To excite; to pre-excite; to re-excite.]

V. " " *impelled.* Acting under momentum. Mood. [Impulsion; pre-impulsion; re-impulsion. To impel; to pre-impel; to re-impel.]

W. " " *inclined.* Acting under inclination. [Inclination; pre-inclination; re-inclination. To incline; to pre-incline; to re-incline.]

See the Index for the words Explanation, Why, Cause, Effect, Power, Energy, Faculty, Motion, Change, Space, Time, etc.

13.—A Bird's Eye View.

We passed in review the various psychological schools: the reflective, the physiological and the quantitative. In each instance it was found that the positive acquirements were scanty in an undue degree, and this was attributed to the fact that psychologists had not put themselves in close touch with the scientific method. Accordingly, it was laid down that in psychology, as in physics, there must be systematic observation, generalisation and experiment, while hypotheses that trespass beyond the fringe which borders our knowledge must be condemned as unscientific. For the guidance of the student the author also added and illustrated what he considers are the methods to be applied in psychological inquiries.

PART II

GENERAL ANALYSES

CHAPTER II

SYSTEMS AS DISTRIBUTED*

Men attend, whilst 'wake they be
Ceaselessly and equably.

14.—ATTENTION AND INATTENTION.

IT is winter time, and several of us are sitting around the blazing waiting-room fire. [*Observe such an occasion.*] While the others are busily talking, I am reading. The rumbling of trains penetrates from the depths beneath. Doors are being noisily opened and shut. Some persons are speaking loudly now and then in different parts of the spacious room while others may be heard crossing it. The street below sends its quota of noises. The place is haunted by sounds, if we but incline our ears. As with the sense of hearing, so with the sense of sight and with general sensibility. Yet, since the book I am interested in contains extremely hard passages, I am entirely absorbed in what I read. Consequently, so it seems, I hear nothing, I see nothing (except the page before me), I smell nothing, and I feel nothing. Or did I really hear and see and smell and feel, and have forgotten that I did so?

15.—SENSATIONS, IMAGES AND FEELINGS DO NOT EXIST APART FROM ATTENTION.

To test the likelihood of this conjecture, let us inquire into what is implied in following a conversation. In attending to speech we make good what is not pronounced, what is half-pronounced, or what we do not hear.† We put spaces between the words. We range them into sentences, and the sentences into paragraphs. Inwardly, we track the trend of thought. For

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[*] I have assumed, what I feel to be indisputable, that physiology offers as yet no scientific data of an advanced nature for the student of psychology.

For convenience' sake I have retained the term Attention, in spite of its vagueness and its misleading implications. My own opinions are summed up in sec. 33, and more especially in the last paragraph of that section.

[†] The conjectured trend of thought often helps us in interpreting what is only partly heard. Thus, having a headache, and some one saying to me "Are you going at eight?" I took that person to say "Have you a headache?"

the purpose of illuminating what is put forward, memories of all kinds are awakened, involving sometimes a considerable strain. On the other hand, what is irrelevant to the conversation is kept jealously apart. The rumbling of trains, the opening and shutting of doors, the movements of persons about the room, the chatter of other groups, the street noises, must not be intermingled with the conversation, or else all will be confusion. As with irrelevant sounds, so with what is irrelevant in general. Plainly, to follow a conversation argues a complex process. That process, in the case we are considering, implies a double direction. We must make sense of what is said, and we must banish what is irrelevant. If that be so, it becomes probable that I could not have followed the conversation while I was absorbed in reading. I was occupied with the book. Nothing else could I even have recognised as something or as a mass, unless the direction of the attention had changed. The sounds, sights, and other sensations—supposing, what is a contradiction, that there were such for me—jostled each other freely, and possessed precisely a like value. They were ranged in time, and not in order. The ordering is a distinct act.

A puzzle picture will help to elucidate the part which the sense of order plays. [*The student should have a puzzle picture before him.*] If we do not at once perceive the hidden figures, it is not because the outlines are not there. They are there just as much, or as little, as are the outlines of the figures first observed. It is only a certain form of education, leaving aside heredity, which forces us to see one set of lines to the exclusion of another set. Apart from educated activity of an advanced character there are only lines on the card, and the business of the attention is the formation of these lines into a distinct whole. When the attention is not directed to that task, we have no whole whatever. Indeed, the background, the lines, and the surrounding objects are one indifferent mass, or have passed away altogether, when the attention is withdrawn from them. To discern a single line, preventing fusion with the background and with the surroundings, to discern at all, implies attention.

Some geometrical patterns offer another convenient illustration. According as we direct our attention, so the lines form one whole or another,* X, W, M, V, □, △, etc.

Lastly, any bold sketch in black and white brings out strikingly the importance of regulative activity in forming an intelligible whole out of scattered lines and hints.

One may now with confidence answer in the negative the question which we asked at the end of sec. 14. Apart from acute attention, *i.e.*, complex activity, there is no such thing as a conversation, and hence, as I did not busy myself with it, I could not have followed its windings. To this must be added that the simplest sensation implies a complicated process. We are justified, therefore, in concluding that nothing intelligible—no total, no detail, no form—exists for us in the absence of attention. The whole outer world as given by the senses, as well as the whole inner world, is essentially dependent upon it. In walking along the street every object we meet with, however faintly perceived, is, *qua* perceived object, due to an intricate process.

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* The question of visual illusions is fully dealt with by Lipps, *Raumaesthetik*, 1897. The reader may also consult Bolton, *Illusions*, 1898; James, *Psychology*, 1890; Jastrow, *Illusions*, 1892; Judd, *A Study of Geometrical Illusions*, 1899; Sully, *Illusions*, 1895; Thiéry, *Ueber geometrisch-optische Täuschungen*, 1895; Titchener, *Experimental Psychology*, 1901; and Wundt, *Die geometrisch-optischen Täuschungen*, 1898.

16.—ATTENTION IS DEPENDENT ON STIMULI.

Ex nihilo nihil fit remains nevertheless true in psychology. Attention, at least physiologically considered, is powerless in the absence of extra-organic or organic stimuli, and is conditioned by their differences. Bent on attending, we may hear or we may see; but we cannot indifferently hear or see. Only certain light-waves or sound-waves, or what corresponds to them, lead to sight and hearing, while in their absence there will be neither visual nor auditory sensations. Yet it is still true that sensations and images, as such, are essentially connected with the action of the central nervous system. Open eyes and open ears, unless exploited, yield neither sight nor hearing. They offer faint modifications, void of tangible significance, which, if they are not instantly, or within a few seconds, utilised, remain lost for ever. They cannot, by any effort, be afterwards elaborated into a self-sufficing system of thought, *e.g.*, the conversation which I missed I cannot build up afterwards by any effort of the will. [*Test this.*] It happens, though, occasionally that we have been told something very rapidly, and that we only decipher the word or the phrase after a moment or two. [*Observe instances.*] Here, however, there is something definite to work upon. There is before us a distinct whole which, by re-attention, is transformed into another whole.*

We have advanced a step. Not only could I not have followed the conversation because of absence of attention; but to me, fully absorbed as I was, there came only doubtful impressions, and no sound or other sensation.

17.—THE BEGINNINGS OF SENSATIONS.

Where, then, lies the threshold of a sensation? This must be cleared up before we proceed. Under normal circumstances the sounds of the conversation would have seemed of a certain pitch and strength. Corresponding to them we meet with air-waves of a certain size and frequency, and these condition hearing. Given equal attention, and, within narrow limits, the sounds we hear vary with the air-waves which reach us from every direction whether we are pre-occupied or not. [*Test this.*] Does close attention to the book necessarily mean that these air-waves yield nothing, because they yield no sound, and that they leave no trace in the

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*As to this last point, see Daniels, *The Memory After-image and Attention*, 1895; also Lotze, *Psychologie*, 1881, ch. 3, § 4.

brain? Inquiry negatives these suggestions. I know that if I had been reading the book in a room where all was still, the course of thought would have been in an appreciably different state from what it is when I am reading in a noisy railway station. [*Test this.*] I somehow continue to ignore the conversation. I hold the sounds back, as it were. I stave them off. I prevent their intrusion. That is to say, I attend, among other things, to something which, when more fully or differently attended to, is sound. At this lowest point we are confronted with a vague detailless feeling. As the air-waves are less impetuous, so is the feeling vaguer, until at last we detect neither sound nor feeling. Probably there is a point where minimal systems become differentiated, and that point must be for us the threshold of a particular system. The lowest element is, therefore, a very faint feeling,—a feeling so faint that it makes no perceptible stir, and is apparently not reproducible,—a feeling which is perhaps so unstable that it disappears immediately it is specially attended to.

States of this faint quality exist in abundance. A good example is the effect produced by a noisy clock in an otherwise quiet room. Ordinarily, when absorbed, we do not hear the ticking, except at intervals. [*Is that so?*] We seem oblivious of the acoustic waves. Yet when the clock stops, we frequently notice the fact. [*Experiment in this direction.*] If the air-waves have left no mark, then their cessation should have made no difference. We conclude, therefore, that the sounds from the clock leave a faint trace on the organism; and also that this trace is not a sound, not the monotonous tick-tick, but some residue. The same holds true under certain circumstances of the innumerable "possible" sensations which we are ever ignoring, and of the silent working of the brain as a whole.

We often observe things indolently. In such cases, our attention no sooner turns away than we forget that we have been attending in those directions. The subject is frequently discussed among psycho-physicists. (Münsterberg, *Intensifying Effect of Attention*, 1894.)

Faint feelings are of considerable frequency. Systems which were at one time sharp in outline and could be easily developed and re-membered, gradually lose these properties without being essentially changed in their constitution. (Ch. 3.) In casual routine processes (or organised re-action)* the feelings are still there generally; but they are no longer lively. The gentle stimulus, under the changed conditions, preserves the motive force of the pronounced activity. The general organic life of the body, the general individual life, as well as the routine of life, swarm with these silent and impalpable presences. However, as organic adjustments to demands become closer and induce far-reaching changes, so feelings are more and more dispensed with, till, with total re-adjustment, they cease to exist. In less extreme cases, the feelings remain, but become almost wholly unobtrusive.

I have said that the dimmest of these feelings form the first degree in the scale of sensations. At their faintest they probably cease to exert an influence individually. It may be asked, "Is it not possible that in routine of a pronounced kind the work is done apart from any feeling?" This is extremely improbable. Reflection, strengthened by observation and experiment, admits feeling wherever there has been feeling before, provided that there has not been a profound change in the form of the activity. Where feeling wholly or nearly ceases, with the attention not diverted, we have discontinuance of the accompanying activity. If any action is ever accompanied by feelings, it will be continued only so long as the feelings continue. If these abate, the action also abates. Common sensibility supplies us plentifully with partial proof. We often sit in a certain position brooding over some problem and apparently oblivious of organic stimuli. [*Repeat this experimentally, recording the results.*] Gradually, quite gradually, the fact obtrudes itself that a limb is tired. There is no reason to believe that in such an instance there has not been a feeling for some time previous; only the uneasiness was so faint that it made no appreciable difference to the organism. Very slowly that difference developed until it is recognised as a particular stimulus. Hence when we are strongly absorbed, it is necessary to increase a stimulus considerably before action or feeling ensues. One other instance. I go to my shelves to take down a volume. [*Observe such instances.*] I do not apparently think of my errand. Suddenly, in the midst of some thought, I come to a standstill, and ask myself where I am going. However faint the residue or whatever its form, we must yet assume that the notion of an errand normally persists, and that when the notion vanishes, we naturally stop. Considering such happenings as these, we are warranted in assuming that no felt process ever becomes a feelingless process unless, indeed, a change or growth supervenes which displaces such process. (Sec. 56.) [*Examine.*]

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* To emphasise the process involved in habit, I shall generally speak of habitual process as organised process, organised trend, trend, and economisation.

18.—THE AREA OF SENSATIONS AND IMAGES.

More difficult still than fixing the beginnings of sensations and images (or primary and secondary systems), is the determination of their sphere of influence.

It may be generally posited that wherever there are nerve-endings, or that wherever the influence of the cerebro-spinal system extends, there exists at least a possibility of connected feeling. Under ordinary circumstances, it is reasonable to suppose, the majority of the feelings are so void of detail that they do not affect the general development of systems, at least not individually. The same holds good of stimuli when we turn towards them only minimally. Exploiting our general sensibility, *i.e.*, those sensations not derived from the five senses, we gather that various portions of the body yield sensory systems when attended to. [*Carefully repeat the following experiment.*] I feel that I possess toes and feet, though I cannot tell from my observations the number of toes, or the fact that they are imprisoned in wool and leather. The feelings are extremely homogeneous, and it is very difficult to discover any details. Thus I observe feelings of the same simple nature throughout the length of the lower limbs, especially where they are crossed, as they sometimes are, in sitting. So the other portions of the body, more particularly where they touch an object or produce slight discomfort, give rise to feelings which are little differentiated. Ordinarily these do not develop; but now this portion becomes stiff, now that becomes tired; now this position is unsuitable, now that part is over-heated or too cool. For this reason, attention to the body is intermittent.

19.—THE SENSE PROBLEM.*

Five senses are generally allowed for, to wit, sight, hearing, touch, smell and taste. Inquirers have not been slow to add to this list. Among the additions proposed are the muscular sense, the temperature sense, the organic sense, the sense of equilibration, as also the pleasure-pain sense, and others. A strictly psychological investigation is not satisfied with these classifications; for they are based primarily on the circumstance that certain easily definable happenings go with certain sensations, *e.g.*, the feeling of heat goes with frequently observed wax-melting weather, and that of cold with weather which sets the teeth chattering. Reasoning along this line, an event only needs to repeat itself often enough and it is assumed that a new sense is created. Leaving aside, however, the sources of the sensations, we come to the conclusion that there appears no good reason why all the sensory shocks we are liable to, with the provisional exception of sight, hearing and smell, should not be regarded as one sense. Cold, heat, pains, organic and muscular feelings, may well be thrown together for scientific purposes. So with the sense of contact. Touching a light object of similar temperature to my hand, it soon becomes doubtful whether I am touching anything at all, and, similarly, I believe I can feel the pencil behind my ear, though I have removed it some time previously. The various sensory systems connected with touch, such as contact, pressure, softness, hardness, smoothness, roughness, are, therefore, essentially organic sensations, only to be differentiated for practical purposes or for purposes of restricted classification. The sense of smell falls into the same category of feelings as the other senses we have mentioned.° It is so evident that we connect the sense of smell with our breathing through the nostrils [*Experiment*] and that the reference to an object of sight or touch outside the body, *e.g.*, to a seen flower, is an after-thought. The sense of taste naturally forms no exception, for here also the thing tasted may be ignored. Objective reference is, however, seemingly unavoidable in thought when the sense of hearing is in question. I have not been able hitherto to localise my hearing in the ear or in any other portion of the body, except when the sounds were shown to proceed from parts of the

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*The known facts as regards the sensations are well marshalled in the second chapter of Külpe's *Psychologie*, 1893.

body. To naïve observation it is as easy to imagine that the auditory nerves are placed on the finger-tips as in the ear, a fact which separates hearing from the sensations previously referred to. This unlocalisability is almost as strongly marked in the sense of sight. These two most highly developed senses, employed as they are incessantly, constitute at present in the adult—not in the child—a group which is clearly distinguishable from the dependent senses which are referred to some portion of the body. Another difference between the two groups remains to be noted: in the dependent group the sensations show little detail, while the senses of sight and hearing display much detail. However, I will assume here that the two groups appear as one in the final analysis; and I would suggest also that the secondary or memory group may profitably be assimilated with the first two groups.*

We may approach the sense problem from another direction. Finding that a sensation, say between the shoulders or in the mouth, is imperfectly localised, *i.e.*, unaccompanied by another class of sensation, we learn, on reflection, that localisation is itself a matter of growth. Thus the infant, omitting hereditary tendencies, is readily thought of as having sensations which are not connected with other sensations, and which become so only in process of time, *e.g.*, the feeling of cold is only gradually connected with the visual and other sensory and motor constituents of the bodily parts which suffer. The adult's sensory field, in this respect, may be, therefore, regarded as a highly developed complex.

Attempts at unifying the senses have been chiefly made in two quarters. Spencer (*Psychology*, 1890, i, pp. 148-52) assumes a primitive shock as the origin of all sense systems; while Horwicz (*Analysen*, 1872-8, passim) traces every primary or secondary system back to the primitive sense of pain.

Sensations are regarded as possessing several properties in common. Each sensation is supposed to possess (1) intensity,† (2) quality, (3) feeling tone or pleasure-pain tone, and (4) extensity or local sign, besides (5) duration.

(1) The existence of intensity is not an easily demonstrable fact. We speak readily of a sensation being intensely painful, as a toothache, for instance. Yet if we compare different painful sensations, we find in the sensations themselves no obvious marks which can serve as a basis of division. One of two pains may be judged much more intense, yet an analysis scarcely discloses a difference as regards sensations. In other cases, again, the so-called intensity must be connected with an increase in

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* See for further discussion the end of this section and ch. 8.

† "All our ideas of intensity, when traced to their origin, refer to the degrees of our feelings. We speak of intense heat and cold, intense pressure, intense pleasure and pain, intense passion, intense bitterness and sourness, intense irritation; in all of which cases we speak of feelings in respect to their degrees" (Spencer, *Psychology*, 1890, ii, p. 266). See also Sully, *Human Mind*, i, pp. 86-90; Preyer, *Elemente der reinen Empfindungslehre*, 1877; Preyer, *Ueber die Grenzen des Empfindungsvermögens*, 1868; Preyer, *Die Grenzen der Tonwahrnehmung*, 1876.

the painful area affected. Strictly speaking, it would be impossible to tell from a pain sensation whether it is intense or not, *e.g.*, a bad attack of neuralgia did not reveal to me sensations of any intensity. We tell (ch. 6) the difference by the varied manner in which the central nervous system reacts.

When we consider the question of heat and cold, the same facts meet us. As we become hotter, a host of changes are engendered: the heat spreads; comfort is felt; the heat becomes uncomfortable, and, at last, intolerable and burning. Indeed, when we touch unawares something ice-cold, we may think that we have touched something hot. In the evolution of felt cold, non-cold sensations indicate what is called the intensity. The stiffness and unmanageableness of the limbs, the smoothness of the palms, and the reactions generally, are the principal indications of cold. A very cold hand yields a wealth of sensations for the classification of which I should not like to be responsible. Organic changes of an extensive order destroy in this way the notion of simple intensity.

Experimenting with pressures, no more satisfactory result is obtained. Lifting an ounce is accompanied by passing sensations in the finger tips; in lifting a heavy book, sensory changes supervene right up the arm; and in lifting a heavy piece of metal, the whole body—head, trunk, extremities—seems to become alive with sensations. On the other hand, putting these different weights in a balance, no such multitude of changes is traceable. Hence "intensely heavy" has here again reference to complex organic changes which are of secondary importance as far as the feeling of pressure is concerned. We conclude, therefore, that increase or decrease of weight or pressure, is marked by changes which defy mathematical statement.

If we examine the other senses, the same state of things repeats itself. An intense light is one that hurts our eyes or one that illuminates well. In the first case we have a special non-light effect, for pain is not a fact of light. In the second case we also ignore the light, and study its illuminative effects. An intense light is also better seen, shows more details, and is more easily attended to; but these properties refer to the nature of the attention process. A dull light has after all a different quality from a bright light.

A similar analysis holds of the other senses. [*Test.*]

We may hence conclude generally that while certain definite and easily calculable changes are observable in the non-organic world, these are, roughly speaking, accompanied in the organic world by indefinite and only indirectly calculable effects. It is one thing to register the fact that a change is felt; it is quite another to determine the nature of that change. For this reason the word Intensity is scarcely used in the following pages, the words aggressiveness, obviousness and warmth of feeling taking its place. However, I have no intention of declaring that the question is settled.*

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* See Heinrich, *Die moderne physiologische Psychologie*, 1899, pp. 43-58.

Fechner (*Revision*, 1882, p. 146) thus defines Weber's celebrated law dealing with intensities "The sensory difference for two stimuli does not alter when the stimuli, on a change in their absolute magnitude, retain the same relation to one another, that is to say, when the relative difference between the stimuli remains unaffected."

(2) The quality of a sensation is more evident.* Blue is different from red and red is different from green.

The difficulty arises when we wish to determine the limits of qualities, and for this reason it would perhaps be safest to say that every appreciable sense change is a change in sense-quality. Thus two reds which impressed us alike would be the same in quality; while absence of identity would imply difference in quality.

It is not easy to discover sharp divisions in the qualities. If a certain shade of bright scarlet and a certain shade of dark green were the only two shades known to us, we should have two defined colour qualities; but this is far from being the case. The sea at which I was looking yesterday, showed, if I mistake not, distinct traces of all shades of grey—from white to nearly black, all shades of green, all shades of blue—from greenish blue to purple, all shades of yellow, and traces of red in the purple. And these variations melted one into the other † What is true of the colour sense, seems generally true of each of the higher senses. [*Test.*]

The graver question now arises as to whether one sense shades into the other, whether, for instance, hearing shades into seeing. We have learnt already in this section that the inferior senses apparently do so. If I now gradually lower the eyelids till they are almost closed and look at an inverted picture, I notice the following. [*Experiment.*] Through loss in detail the sense of depth is entirely gone, and from the same cause, things are located nowhere, or, as we should say, in the eye. The blur which excludes colours, forms and spatial relations, suggests something felt rather than seen. At all events, this blur seems to me distinctly of the nature of a confused feeling, almost void of all optical suggestion, certainly free from shapes or lines. In this manner it is possible that we may bridge the widest gulf between the senses. Again, a low hum, when it is a question of the sense of hearing, is equally suggestive of feelings like touches or temperatures ‡

(3) The nature of feeling tone or sense-feeling, is amply discussed in ch 6.

(4) According to Prof. Ward and others the feeling of extensity is the basis of extension. Thus he reasons that if we paste one postage stamp on the back of the hand and then one next to it, we obtain a sense of difference which lies at the basis of the sense of extension. [*Test.*] I have tried the experiment, but with most disappointing effect, for the sensations themselves gave no notion of the space covered; strictly speaking, indeed, they did not tell that any space was covered. The sensation was

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* As to the nature of quality, see Sully, *Human Mind*, 1892, i, pp. 90-4.

† Magnus, *Die Entwickelung des Farbensinnes*, 1877.

‡ For a fuller discussion, see sec. 189.

only connected, and that at first alone, presumably through fore-knowledge, with a particular portion of the known hand. From this Prof. Ward and others argue that every point of the body's surface yields sensations of its own, and that from these differences, from these local signs, we develop the notion of extension. Hence even in sight the points affected by stimuli are supposed to yield us the material for spatial judgment. The fact that the bodily surfaces are part of an *organic* structure, should make us diffident in too readily adopting Prof. Ward's view. Besides, the cases cited are far from convincing. I may have a piece of something in a tooth, and yet not know which tooth, whether upper or lower, whether to the right or to the left. Thus perhaps, generally speaking, localisation is the result of organisation of sensations into systems with the constitution of which we have become familiar.

Prof. James has a long chapter on Space, in which he contends, unfortunately without referring to the facts, that extensity is a primitive quality of sensations. As Ward, equally with James, says little concerning the actual cutaneous systems, I shall here insert a few words on the subject. (1) I pass the tip of a finger across a basket chair. Here we have alternating feelings of pressure, warmth, smoothness, softness and strain, besides the feelings connected with the other portions of the hand and arm affected; and in addition, there are feeling-less intervals, and the skin feelings are connected with sights, movements, etc. (2) Instead of passing the finger tip over the object, I pass the object over the finger tip, with similar results. (3) Instead now of using one finger tip, I experiment with various portions of the body, with like results. (4) Much practice has made us experts in interpreting touch systems, *e.g.*, the bridge of the nose feels hard and smooth; the lips feel soft, warm and rounded; the back of the hands feels hairy, irregular; and so forth. Since, then, movements and sensory systems are familiar to us, we interpret what happens by means of a number of signs which remain almost the same with every portion of the body usually employed in touching. This is the easier to understand when, as we shall learn further on, we find that change or movement is essential to tactile divination, and that absence of attention leads to tactile insensibility. Our first conclusion, therefore, is that as localised cutaneous feelings are largely due to touch, they are interpreted in the same way; the relative softness, warmth, irregularity and strain being our guide. The whole body would in this way come to be known, and the cutaneous feelings would be connected with sights, touches, notions, etc., forming an easily interpreted system of knowledge. Further, the most intimate cutaneous feelings are only exemplifications of the factors met with in touch. Hence a variety of factors *and not specialised feelings*, will indicate the locality of a hurt or a single touch.

It would be dangerous to dogmatise as to whether there are any essential differences in the different feelings derivable from various parts of the cutaneous surface. What I do hold is that there are no appreciable differences. There may be more diffused strains, more pricks, more changes; but these cannot be called sensory qualities. Consider the complexity of the problem. A small piece of paper is allowed to touch the back of the hand, and is then removed. Now touch fibres are not very closely placed, and therefore only some points of the surface are touched; the surface is very irregular, and hence not every fibre has been touched; the effect extends to other parts and to deeper lying parts of the hand; strains diffuse the effect of the contact; and constant attentional and organic re-adaptation produces other rapid changes. If we carefully attend to the feelings, nothing but casual pricks or dim changeable feelings are noticeable, while where a feeling is only vaguely localised, there the feelings connected with it and already known hint at its position. Thus the data in any instance warrant no conclusion as to size of any part affected or as to its position or shape. To put it differently, *any*

of the various cutaneous feelings, however extensive in fact, are easily imagined as being connected with a spot of 1 mm. in circumference in any portion of the body.[*]

Hence our general conclusion is that ***sensations have no primitive quality of extensity or volume***, and that such qualities are due to complex developments.[†]

A special study of the nature of touch suggests conclusions of wide bearing and cardinal importance. Placing the fingers, hands, arms, limbs, head and other portions of the body, in different positions, and resting them in that position for some little time, it is found that the customary sensations connected with such acts of contact disappear. Especially is this the case when the eyes are diverted or closed, or better still when the position is not uncomfortable and is not chosen. Hence the first conclusion, generalised, runs: *Total rest excludes all sensations.*[‡] [*Test.*] This proposition explains various points of interest. It obviates the strained assumption that there is a hidden field of attention in which all that would be detected by the live senses within and without the body, has a place and leaves an effect. It implies rather that absence of normal attention argues a deadness or slumber as regards feelings in those directions. It explains how that which is monotonous makes men drowsy, tends to hypnotise them, and how quiet sleep, and life immediately after birth, is sensationless. Hence, naturally, when falling asleep or awaking, we cannot easily tell how the different portions of the body are disposed.

Sensations, then, imply change or movement. If, accordingly, after careful conjecture, with eyes closed, I calculate that a finger lies in such and such a position, I have only to move if I wish to make certain of whether I am right or wrong. Consequently, we reach our second conclusion that *sensations only exist where there is change and where such change is not monotonous or repetitive.* [*Test.*] This conclusion completes the first one, for we find that any monotonous system of changes leaves as little of a sensory residue as monotonous rest; that, indeed, the two, if closely considered, are one.

These two conclusions fail apparently to explain how we can, for instance, apprehend a series of touches simultaneously; and, in fact, by themselves the two conclusions leave the problem just raised unsolved. What we find, however, is that all normal sensing or integrating implies after-sensations. For example, trying to read a newspaper poster at some little distance in a very busy thoroughfare, I find that, owing to the many intervening passers-by, I can only catch a few letters at a time. This suggests that though after the reading, and as we read, we may see a considerable portion at a glance, we really observe but a minimum at a time, the other portion being the effect of the retarded death or slow vanishing of minimal sensations. Hence we reach the third conclusion that *without after-sensations, there are no sensations proper.* [*Test.*]

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[*] Stricker (*Das Bewusstsein*, 1879) reasons, incorrectly in my opinion, that we instinctively know where a sensation is to be located. He says, for instance: "Persons who have not the slightest notion of the position of their internal organs, can tell immediately where the pain is felt when an internal organ becomes diseased and pains them" (p. 33).

[†] The question of extensity is ably and almost exhaustively discussed by Lotze, *Medicinische Psychologie*, 1852, bk. 2, ch. 4.

[‡] Preyer (*Die fünf Sinne*, 1870, pp. 26-7) mentions that in sitting quite still, all sense of position is lost, and he explains that active touch and sight are necessary to determine position. See also Sternberg, *Die Lage unserer Glieder*, 1885.

A difficulty which was met with in the course of arriving at the first conclusion, brings us to our fourth conclusion. I had frequently noted that I interpreted any particular sensation or position by the many others that were combined with it, *e.g.*, I connected the sensations in the fingers with the sensations in hand, arm and trunk. Following the hint, I arrived, after some experimenting, at the result that we very seldom observe a sensation by itself; but that we generally deduce its place from its known position in a considerable system of sensations. In any case of doubt, due to whatever causes, as we have seen when speaking of extensity, we, therefore, to some extent, arrive deductively at the nature and the place of any sensation. For this reason, to the adult, and this is our fourth conclusion, *sensations are given in an organised system.* [*Test.*] An organised system implies a preceding chaos, and accordingly we learn that to the infant, sensations appear, as it were, in the air. Unfamiliar and unconnected as the infant's sensations are, he neither places them nor heeds them much. Only with more of life, do the tactile feelings become connected with each other and with other classes of feelings and sensations. Hence touching, like seeing, is meaningless to the infant, and only grows to have a meaning for him as the course of events welds together similar sensations into different systems. At least, the infant of four months whom I had under observation since birth, fully illustrates what has been said above. Two problems are involved, among others, in the conclusion reached, in this paragraph. The first one is that *all uniformity as expressed in character, general thought, special thought, primary and secondary existence, action, movement, space, time, order, and the like, are but an exemplification of organised complications, of precisely the same weight fundamentally.* My observations on infants, and the experiments which form the basis of these conclusions, also suggest that, in the human being at least, there is steady development along all the lines, and not full-blown inheritance. The second problem refers to dreams specially, and illustrates incidentally some of the problems of the imagination and the memory. Mr. Bradley (*On the Failure of Movement in Dreams*, 1894) has raised the question of how far we feel whilst asleep, and here I may venture on an answer to his query. As dream-life implies considerable disorganisation, so it implies disorganisation among the sensations, aggravated by disorganised movement. Hence I have more than once satisfied myself that in dream-life touch (and other) sensations are freely ignored and freely placed into any kind of fanciful system, the reason being that fundamentally the value of the parts has no defined meaning apart from a larger whole.

In some experiments upon effort, with the attention diverted, I found to my surprise that while the effort—say, of freely holding some heavy object—continued, all "sense" of effort, together with the many connected arm and other sensations, were lacking. This confirms our second conclusion that sensations only exist where there is change. I have since observed in many instances that habitual action—and most action is habitual—is only accompanied by sensations when a certain maximum share of attention is turned towards it. *So in all kinds of aches, as neuralgia, minimal concern with the ache, excludes sensations.* Hence we reach the fifth conclusion, that *sensation and muscular activity are not necessarily connected.* This becomes obvious when studying the development of an infant: the incessant movements (still fitful and clumsy) of every limb and every portion of it, are evidently something quite apart from the accompanying sensations. As we shall see in ch. 6, the bare feelings in aches suggest no pleasure-pain value and no action; and what holds good of the adult, holds good, of course, with increased force of the infant. Strictly speaking, the sensations are one thing, and the movements another. The feelings—as distinct from movements—connected with fears, joys, pleasures and pains, are something separate and develop to a large degree separately and differently, and to some extent remain always separate.

Finally, our special study of touch sensations suggests a sixth conclusion, namely, that *all sensations and sensation complexes, all movements and movement complexes, as they appear in the life of an adult, are close repetitions of previous sensory and motor complexes.* [*Test.*] I found that, however I varied or found varied the postures in sitting or standing, or whatever varied movements of a large or a small range I made, it was always some movement which I had previously practised. The only exceptions were such as occurred in accidents or in learning a movement. Infant life makes this conclusion intelligible. The child, as if it had in view a deliberate purpose and one well-conceived, is constantly performing fitful movements of endless variety; and it keeps performing these till, to all intents and purposes, it has run the gammot of possible movements and their combinations. An adult, therefore, re-members, re-performs the overwhelming majority of his actions. And what is true of movement, is true of percepts and ideas, of primary and secondary compounds. By the time the infant has been transformed into the adult, the thoughts and the classes of thoughts combine according to habits that have become no less unbending than the laws of the Medes and Persians. Petty shifts, undiscriminating habits and piercing thoughts, are all equally the result of growing organisation, determined by natural selection within the life-time of the individual. As we shall see in chs. 3 and 4, our whole life, at every stage of development—including the simplest sensations and movements,—reflects systems of organised complexes, and all change is produced by a further differentiation in such systems *under the pressure of needs.*

20.—CLASSIFICATION OF SYSTEMS.

The classification of systems, after what has been stated, becomes a comparatively unimportant matter. Perhaps neurology will, in time, draw for us distinctions which we do not now admit. Still, such conclusions as we have reached shall be exhibited here. Under the heading of *feelings* should be ranged sensory systems which are indefinite and not easily definable in their nature. (1) Those feelings which generally accompany pleasure-pain belong to the class we are considering. They cannot be defined from each other or from other feelings. The connection between them and pleasure-pain is accidental. (Ch. 6.) (2) The feeling of effort or self-assertion must be ranged with the above. Were it not for the physical effects which we note, we should never think of distinguishing between it and other feelings. In itself it has no power, no more than a visual system. It is a servant and not a master. It is in attendance and not in command. (Ch. 7.) (3) To the same series belong the emotions. Their importance is fictitious, and is only derived from their association with activities more or less violent. They have no more power to move us than the other feelings. (Ch. 7.) (4) The passions, desires and appetites belong to the same category, their complexity being constituted by their many known relations. (5) So also do the feelings of touch; those connected with temperature, pressure and the muscles; and intra-organic feelings generally. (6) Those feelings which constitute the general impression which an object makes on us, and which we shall call summary feelings, belong to the above order. (7) Combination feelings must be similarly placed; they embrace those feelings of doubt, certainty, reminiscence, oblivion, etc., etc., which can be traced in the course of thought. With a more detailed study of sensibility these are destined to gather more and more meaning; but at present they are unattached, like the infant's bodily sensations. With psychological progress will come localisation in a system. The above enumerated feelings should be looked upon as elementary systems or feelings.

Nearest to the above feelings is the sense of taste and that of smell. These, especially the latter, have a stronger individuality than the feelings we have enumerated. Let us call these *semi-advanced sensations*, as representing a transitional form between feelings and advanced sensations.

The *sensations* of the first order are seeing and hearing. In these alone, if we omit physical exercise, is a synthesis possible. There is no counterpart to a melody or a picture in either feelings or semi-advanced sensations. However, sight and hearing do not occupy the same position, for sound has considerable affinity with feelings. The sensation of hearing, except for its synthetic and objective character, is hard to distinguish from feelings proper. A noise in the head, a jarring sound, reminds us of the latter. In sight, on the other hand, the synthetic character is prominently marked; the features can be distinctly defined; and passivity of effect is almost absolute.

The life of action, inclusive of memory, falls under the headings of primary and secondary feelings, feelings or elementary systems, semi-advanced systems, and advanced systems. In the secondary series there are no new elements discernible: we see and hear and feel as in normal outward life, only the springs are central rather than outward or afferent (ch. 5); but that in itself constitutes no striking difference. If sight is best re-produced, that is because it is the king of senses; and if smells are hard to re-integrate, that is probably because smell is so seldom resorted to. With varying evolution any of the other senses or feelings might occupy the place of sight (sec. 189.)

Systems are thus divided into (1) feelings or elementary systems, (2) semi-advanced systems and (3) advanced systems. The three together may be called Systems.

The mechanism of thought is as yet only traceable on the neural side.

21.—Keen, Normal and Lax Attention.

We have seen that the endeavour to understand difficult paragraphs was inconsistent with following a conversation. What is the fact which explains this inconsistency? Why should keen activity in some directions exclude keen activity in other directions? Further investigation will, I hope, supply the explanation. Meanwhile we may here profitably investigate the degrees of attention.

The book which I read I found, at best, troublesome to follow. To secure adequate comprehension, intricate passages, with their windings and interconnections, had to be grasped simultaneously. In trying to assimilate what I was reading, the attention had to be more and more restricted to the elucidation of some detail, and had to be kept fixed on that. [*Challenge the preceding statement.*] I had to be oblivious of everything that passed about me. Such *keenness*, such prolonged preference, is, however, not common. It more frequently happens that we are interrupted by a conversation going on near us, or by any striking sound, sight or other sensation. [*Observe normal occasions.*] Usually we should find it difficult not to listen to at least parts of the conversation, and commonly we should also notice various trifles. In this *normal* condition the field of attention is not determined for any length of time by one thought, and we are not so absorbed that we could not be easily aroused. We still ignore the majority of objects around us; but these are not of a nature to appeal to us strongly. Advancing another step, in the opposite direction to that of being absorbed, the attention becomes *lax*, and we find ourselves rambling in thought, following everything in turn, but nothing long. We are, in fact, in a state of reverie: more open to overtures, while the field of activity is changing repeatedly. [*Examine such cases.*] Hence we see that (1) in *keen* attention we are *almost wholly* oblivious of our surroundings (inner and outer); (2) in *normal* attention we are *to some extent* oblivious of our surroundings; and (3) in *lax* attention we are guided *almost solely* by casual impressions derived from our surroundings (inner and outer).

To conclude. *Looking about me carelessly I notice little in each of a large number of objects. Looking closely I apprehend about as much in one of* *those objects.** The amount observed has remained the same in both instances.† Whether attention is keen, normal or lax, entails no difference as to the quantity dealt with. [*Try to disprove this.*]

22.—ATTENTION, IN THE NORMAL WAKING STATE, IS QUANTITATIVELY ALIKE WITH ALL MEN AT ALL TIMES.

It appears from the above that the total quantity of attention or neural activity is always the same, or nearly so, increased activity in one direction being at the expense of decreased activity in another. Attention, again, being transformation or expenditure of energy—on the physiological side—we can understand how it is that, if our fund is limited, employing labour in one direction, as in concentrating our forces on the niceties of one problem, we are debarred from employing the same part of the fund in another direction. If we, therefore, wish to attend to many details at once, the activity must be judiciously distributed over a large area, *i.e.*, we notice little in each of several objects. Hence keenness of attention will vary inversely with the quantity which we wish distinctly to observe or understand. This we find is actually the case, *e.g.*, we can sharply fix a whole landscape; but then its bare form alone can be apprehended. [*Examine the limits of fixation.*] We are not surprised, therefore, that under ordinary circumstances we meet with an amount of attention, or neural activity, of almost equal degree in every human being.

Lipps roughly agrees with the tenor of this section. "When the vital conditions remain uniform, and during short periods, psychic force may be considered as at least approximately constant, and this constancy may be applied to explain conscious facts" (*Grundtatsachen des Seelenlebens*, 1883, p. 174). Here the agreement ends. Ladd makes primary attention to cover the whole field of consciousness. He says: "Primary attention, essentially considered, is the variously related degrees of psychic energy expended upon the different aspects, elements, and objects, in the one field of consciousness" (*Psychology*, 1894, pp. 74-5). Here, if I am not mistaken, Ladd fails to recognise that the "aspects, elements, and objects," are themselves complexes. Kohn (*Zur Theorie der Aufmerksamkeit*, 1895) holds opinions similar to those of Ladd. Excepting these three writers I recall no others who do not very considerably limit the range of attention For instance, Ribot (*Psychologie de l'Attention*, 1889, p 175) contends that if we take men in the mass, "spontaneous and especially voluntary attention represent exceptional states" So Dr Stout, *Manual of Psychology*, 1898, p 65. "Attention is simply conation in so far as it finds satisfaction in the fuller presentation of its object, without actual change in the object."

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* "The greater the number of objects to which our consciousness is simultaneously extended, the smaller is the intensity with which it is able to consider each." So writes Hamilton (*Metaphysics*, ed. 1877, i, p. 237). From the point of view of attention, the distribution, and not the intensity, is changed. We notice a dozen points in a grain of sand, instead of a dozen points in the sea-shore where the grain lay. So also I see the fanciful wall-paper as well as a picture on the wall. Instead, I may lessen the wall-paper detail, and increase the picture detail, and further increase the details as to one figure of the picture at the expense of all other details. Lastly, I may attend principally to the fan in the picture or to a flower on that fan, which flower I had not at first noticed at all. The quantity of detail in all these cases, as can be easily verified, remains the same. Intensity has only regard to the feelings observable in keen attention.

† Stewart (*Elements*, 1808, ch. 2) holds that only the *minimum visibile* can be observed at a time. He thus reduces the field of attention to a point. So Preyer, *Naturwissenschaftliche Thatsachen*, 1880, p. 111: "Only one sensation can be felt at one moment, and that because the attention cannot be divided." See also Wundt, *Messung des Bewusstseinsumfanges*, 1890, and *Zur Frage des Bewusstseinsumfanges*, 1891.

23 —FELT STRAIN, DESIRE TO ATTEND, ETC.

When we speak of effort, or strain, from the strictly psychological point of view, we mean a feeling or set of feelings that indicate the presence of a need which persists in seeking satisfaction in the face of solid obstacles. The feeling of effort is almost imperceptible in lax attention, and, largely so, in normal attention, because, in these cases, solid obstacles to needs do not exist or are avoided. Also, when neural functioning is more vigorous, as on account of a spell of extra good health or spirits, we think with less difficulty, and there appears at such times a feeling as if a strain had been removed When health is precarious, the contrary effect is commonly observed, our thinking being accompanied by a decided feeling of effort When attention is keen, as in pronounced deliberation, this feeling is also noticeable The act of intentionally ignoring the surroundings, of turning from the conversation to the book, is accompanied by a distinct feeling of this nature. [*Add to this list*]

When we try hard to re member something, when we wish to rid ourselves of a thought which resists disintegration, when we follow a closely reasoned argument, when we wrestle with a difficult problem; when we think about a subject in the face of distractions; or when we are dead to the solicitations of sense, or, in short, when a need persists in seeking satisfaction in spite of discouragement, this feeling is present in a marked form We aver at such times that we are making an effort, that there is a feeling of strain, that the mind is active, and the like. The feeling itself belongs to the class of central or thought feelings, and derives whatever significance it boasts of from the changes which it accompanies. This feeling is by no means a measure of work done. When interest is deep, or when excitement or a strong motive is swaying us, we quickly lose sight of the world around us without noticing any considerable strain. On the other hand, in the absence of interest, or when in bad health, there is little work done, while strenuous endeavours of a need to satisfy itself under those conditions are yet unprofitable and fatiguing.

Sometimes, again, we are unable to make a sensible effort, the need being balked as when we wish to stay a torrent of irrelevant thoughts which nevertheless hurries on undisturbed, as if in mockery. We will decidedly, and there exists a determination, which is unchallenged and persists, yet there is no perceptible feeling of effort nor any effect as the result of our volition. Effort and change are not related as invariable antecedent and resultant. "*Change in what is immediately given may proceed in spite of effort to the contrary—one need being easily victor over another, effort may be unable to effect a change, and there may be decided* *willing without any felt effort.* Corresponding with this feeling, but not proportionately, we have on the physical side work attempted or done. After a good night's rest, we are fresh and full of energy. After a holiday, we return to town reinvigorated. After a bad night's sleep, we feel tired, and the attention has its point blunted. After prolonged exertion we are exhausted. [*Test the above statements.*]

Some Opinions.—Bailey, *Letters*, First Series, 1855, p. 85: "Attention, when not the result of strong feeling, . . . is only purposely directing our observation or thoughts to a particular object." Bain, *Emotions and the Will*, 1875: "What the will can do is to fix the attention" (p. 370); "in mental attention we can fix one idea firmly in the view, while others are coming and going unheeded" (p. 370). Baldwin, *Senses and Intellect*, 1890: "Attention intensifies a mental state" (p. 72); "the most essential peculiarity of attention is a feeling of *expenditure* which its exercise occasions in mental life" (p. 69). Beneke, *Neue Psychologie*, 1845, p. 142: "What we commonly call the degree of attention bestowed on a sensory content, is nothing else but the relation between the totality of existing traces [or developed dispositions, p. 219], and the number of those which actually enter into the present content." Bradley, *Is there any special Activity of Attention?* 1886: "Attention (whatever it may be besides) at any rate means predominance in consciousness. . . . That which we attend to is said to engross us. . . . We may compare it to the . . . area of distinct vision in the retinal field" (p. 306); "the machinery [of attention] consists of an idea which is able to dominate and so fixes an object connected with itself" (p. 312). Cappie, *Some Points in the Physiology of Attention, Belief and Will*, 1886, p. 201: "Attention is the bringing of the consciousness to the focus in some special direction." Dewey, *Psychology*, 1887, p. 133: "The essential characteristic of attention is activity directed towards some end." Fouillée, in *Brain*, 1890, p. 351: "Attention rather makes [sensations] more distinct, qualitatively more differentiated by isolating and protracting them in consciousness." Herbart, *Psychologie*, 1825, § 128: "In its essence attention is nothing but the power of producing an intensification of perception." Hodgson, *Metaphysic of Experience*, 1898, iii, pp. 124-5: "Attention is a reaction called forth or determined by new, prominent, or comparatively vivid feelings, or changes in feeling, and is the note we take of them as features in the current of consciousness as it occurs. It is more than the reaction by which we simply perceive; it is a heightened reaction which is forced upon us by certain perceptions, which we then perceive either in contrast with, or to the exclusion of, others." Heinrich, *Die Aufmerksamkeit*, 1896, p. 384: "Where the physiological conditions favour the reception of the stimulus, there men say that the impression has been attended to, or has become clear; where the same conditions diminish the effect of the stimulus, there men say that the impression has not been attended to, or has been vaguely apprehended." Höffding, *Psychology*, 1891, p. 315: "It is precisely the gathering of energy round some one idea as the centre of association, that constitutes attention." James, *Psychology*, 1890, i: "Every one knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalisation, concentration of consciousness, are of its essence" (pp. 403-4). "We never make an effort to attend to an object except for the sake of some remote interest which the effort will serve" (p. 416). Kreibig, *Die Aufmerksamkeit*, 1897, p. 2: "Attention is an act of will directed towards making an outer impression or a reproduced idea, or parts of these, clear and distinct." Külpe (*Psychologie*, 1893, p. 9) holds the regulation views. Ladd, *Psychology*, 1894, p. 81: "The distribution of attention depends upon intensity of feeling." Lipps, *Grundtatsachen*, 1883, p. 620: "Attention is no special psychic force, but reproductive activity itself, concentrating, and by means of concentration more able to overcome obstacles." Maudsley, *Physiology of Mind*, 1876, p. 308: "Attention is the arrest of the transformation of energy for a moment—the maintenance of a particular tension."

James Mill, *Analysis*, ed. 1869, ii, p. 364: "Having a pleasurable or painful sensation, and attending to it, seem not to be two things, but one and the same thing." Lloyd Morgan, *Comparative Psychology*, 1894, p. 189: "We may describe attention as the bringing of something to the focus of consciousness, and the holding it there." Shand (*An Analysis of Attention*, 1894) holds, in opposition to some current views, that attention implies not predominant or clear ideas, but predominant or clearer awareness-of-ideas. Stout, *Analytic Psychology*, 1896, i, p. 181: "What characterises attention proper as opposed to inattention is the singling out of special contents so as to discriminate special objects." Stumpf, *Tonpsychologie*, 1883, i: "Attention is identical with interest, and interest is a feeling" (p. 68); "the essential function of the attention . . . lies in the prolonged maintenance of an idea in consciousness" (p. 72). Sully, *Human Mind*, 1892, i: Attention "secures increase of vividness and of definition or distinctness" (p. 77); "it can be dispensed with in proportion as the psychical process grows habitual by repetition" (p. 78); it is to be defined on its subjective side as "mental activity immediately resulting in a rising in point of intensity, completeness, and definiteness of certain sensations or other psychical phenomena, and a corresponding lowering of any other simultaneously presented sensations," etc. (p. 142); "it is a narrowing or concentrating in consciousness" (p. 144); "attention is detention in consciousness" (p. 155). Titchener, *Psychology*, 1896, p. 125: "The idea to which we attend is made clearer, and lasts longer than other ideas." Volkmann, *Lehrbuch*, 1895, ii, p. 204: "To attend to something means firmly to grasp an idea, a train of ideas, or a presentational mass, and defeat their tendency to sink."

Note on the Above.—The universal opinion appears to be that attention is not co-extensive with thought and action. For my part I find it impossible to agree with such a view, and that for the following reasons. If we take the area of distinct vision by itself without regard to what adjoins that area, we obtain a caricature of reality; for what appears about the focus, though comparatively vague, is still of crucial importance as far as sight is concerned. Indeed, the vagueness is due to the structure of the eye, while, probably, the attention is as much, or nearly as much, engaged with what is outside as with what is inside the focus. For ordinary purposes the *total* field of vision counts, however vague some parts may be. Again, the "distinct" area of vision is in itself but partly distinct, only portions of it appearing in definite outline. This becomes evident when we focus a *part* of some *whole* which we had focussed previously: here some details which had been vague are now clear, while other details which had been clear have become vague. For these reasons, I am tempted to hold that the focus of vision is equal to the total field of vision, or, speaking more generally, that the focus of assimilation at any time is co-extensive with the total field of assimilation. Once more, the meaning of the word attention frequently covers the whole field of activity. We speak of persons attending to their work, to their lessons, to their duties, to their business, and so forth. When, however, a thing is not attended to, the implication is usually that the attention was occupied with something undesirable. To be inattentive means thus in common speech, to attend to any particular object sporadically and carelessly, and not, as I understand it, to attend to nothing at all. Master Scatter-brains and Master Gather-brains are both equally attending without pause, except that the first can overcome insignificant obstacles only, the latter being a giant and the former a dwarf as regards efforts of attention. All things considered, then, it seems strange that psychologists who should be free from the popular bias of only observing what is prominent, should have identified attention with a particular and undefined degree of attention. It is as if one should say that only very heavy objects had weight, or that only very strong men had strength, for the so-called special characteristics of attention are characteristics more or less appertaining to all thought and action at every moment and in every part. The fact that human activity is throughout determined by needs, tends to prove that focalisation, concentration, exclusiveness, insistence or predominance, are general features, though this does not destroy the notion that there are degrees of attention, and that the attention tone is not a constant.

At least for practical purposes it is essential that we should appreciate the bodily aspect of attention. Just as, broadly speaking, men's muscular strength varies only within a moderate compass in the individual and from individual to individual, and that because the organic transformations are equable, so we naturally expect the same to hold good of the brain, and consequently of its functions. This is really the case. The only thing measurable which at all corresponds in the sense realm to work done by the brain is, as we saw, the feeling of effort. But this passing feeling, besides being itself, since it is a feeling, the result of attention, cannot be considered a constant factor in change. In the mind, as ordinarily conceived, we have nothing corresponding to the stable and complex human organism.

Introspection yields nothing for us to measure but the elusive feeling of effort, if we leave aside what is immediately given. Hence we refer to the physical transformations, which we can gauge, to illumine for us the nature of the process of attention Strictly speaking, to express ourselves physiologically, *we mean by attention, neural functioning*, or, less concisely, *the expenditure of that portion of the fund of bodily energy which is devoted to neural functioning.* The act of attention expresses such neural functioning and constitutes primarily a process of organic re-adjustment, as when the healthy stomach craves for food and obtains it through neural mediation. When we say that we attend, we mean that neural changes are proceeding in a certain direction. Similarly, when we speak of the field of attention, we understand, for our purpose, the field of neural functioning. More generally stated: *in the normal waking state something is always immediately given and that something is a constant quantity which constantly changes at a constant rate.* The word Attention is throughout this work employed in the sense here defined. (See further sec. 48.)

I speak of neural functioning, so as to exclude activities not specially connected with the central nervous system, *e.g.*, the actions of the liver or the kidneys. At the same time, however, the total fund of bodily energy can only be parcelled out in theory, while motor activity, alluded to before, is not fundamentally connected with sensations (sec. 19, 5th conclusion). The physical processes which are covered by the words, Work, Energy, Attention, I leave undetermined, and nothing can be said here as to the precise dimensions of the field of attention or of the rate at which it changes. In the present unsatisfactory state of neurology, I naturally decline to commit myself to any theory. For a discussion of the subject on the physiological side, see: Bain, in *Brain*, 1800; Bastian, *On the Neural Processes underlying Attention and Volition*, 1892; Cappie, *Some Points in the Physiology of Attention, Belief, and Will*, 1886 (reprinted in *Popular Science Monthly*); Delabarre, *L'Influence de l'Attention sur les Mouvements Respiratoires*, 1892; Dissard, *Influence de l'Attention sur la Perception des Sensations*, 1895; Féré, *Physiologie de l'Attention*, 1890; Ferrier, *The Functions of the Brain*, 1885, who says that "intellectual attention is mainly ideal vision" (p. 464), and that "the motor centres are not merely the basis of sensory-motor cohesions and acquisitions, but also the basis of the powers of concentration and control of ideation" (p. 468); Fouillée, in *Brain*, 1890; Hamlin, *Attention and Distraction*, 1896, who discusses the numerous physiological theories; Höfler, *Psychische Arbeit*, 1894-5; Hylan, *Fluctuations of the Attention*, 1896; Landmann, *Ueber die Beziehung der Atmung zur psychischen Thätigkeit*, 1895; MacDougall, *The Physical Effects of Attention*, 1896; Marillier, *Le Mécanisme de l'Attention*, 1889; Obersteiner, *Experi-*

mental Researches on Attention, 1879; Pilzecker, *Die Lehre von der sinnlichen Aufmerksamkeit*, 1889; Ribot, *Psychologie de l'Attention*, 1889, who states that "attention acts always on muscles and by means of muscles" (p. 3); Sanctis, *Studien uber die Aufmerksamkeit*, 1898; Stout, *Apperception and the Movement of Attention*, 1891; Sully, *The Psycho physical Process in Attention*, 1890; Waller, *The Sense of* [*Muscular*] *Effort*, 1891, and Washburn, *Subjective Colours and the After-Image: their Significance for the Theory of Attention*, 1899.

24.—DELIBERATE ATTENTION.

Deliberate attention, together with attention under difficulties, or rapt attention, have generally been confused with attention as such. Suppose that I wish to follow a difficult argument in the book which I am reading. Though I strive to attend, my thoughts, as a matter of fact, are wandering nearly all the while. [*Is this so with you? Describe.*] I recur to the argument again and again, and fly off at a tangent almost instantly. We encounter here an ineffectual desire. My wish to attend is only a pious wish, and is not converted into activity in the required direction. On such occasions there may be no felt effort traceable; we may return to our subject with ease; and yet leave it, against our intention, in the same manner. Deliberateness of process is in such cases at a discount. We have to persist ceaselessly wishing to attend, because a single resolution does not suffice. Effort is here useless. The wish, again, must not be confounded with the deed. We are really active in other directions, whatever our wish may be.

If the volitional state is said to occasion certain changes, this belief is explicable on the basis of an insufficient induction; for volition, or an unequivocal resolution, may exist in perfection without influencing the trend of thought. [*Observe such occasions.*] This state is, at best, a fairly reliable sign that a change will take place. Apart from this, its prophetic function, it has only the significance of an item in a series. We might as well argue that the danger signal itself brings the train to a standstill, because the second event usually follows the first; or that trains can only stop when a danger signal is exhibited.

Attention may be successful or telling without the presence of marked strain. A trained musician follows with ease an involved piece of which feat he could not have accomplished at an earlier stage career, however great the effort. It is not that he is now more to attend than he formerly was. On the contrary, he is less But though arduous attention has diminished, its desirable eff increased. Re-attention, by excluding waste of attention, has the virtue of making attention less troublesome, and of enabling us to attend to much with little effort.

Deliberate attention *so-called* is not essentially different from casual attention. Neural functioning is, in the former case more pre-adjusted; it is more exclusive, or keener; it is less diffuse. [*Test this.*] Hence we are more likely to reach a goal quickly. However, the process is still the same in both instances. We are busy with some unfamiliar detail, till, through repeated endeavours, it becomes familiar. Then we are enabled to busy ourselves with a second detail, then a third, until we have at last completed our examination. Attention is strenuously deliberate when it is accompanied by a somewhat more than usually decided notion of an end to be attained. It is action, guided by a rather pressing need or functional tendency, and argues more than normal absorption. In substance, all attention is deliberate, since all thought and action is relational. As I walk along the road my eyes are turned to at least sixty objects a minute, and each object discerned implies deliberate activity. [*Test repeatedly, and describe.*] It is a non-organic view which gives rise to psychological word-couples such as habitual-deliberate, voluntary-involuntary, attentive-inattentive.

Opinions on Voluntary and Involuntary Attention.—Baldwin, *Senses and Intellect*, 1890, p. 69: Attention "is the act of holding a presentation before the mind. It is in all cases a conscious act." Drobisch (*Psychologie*, 1842, p. 80) distinguishes between voluntary and involuntary attention, "the former is directed to objects, the latter is attracted by them." Hamilton, *Metaphysics*, 1877, i, p. 237: "Attention is a voluntary act." Herbart, *Lehrbuch*, 1816 (Hartmann's edition), p. 147: "Attention is partly involuntary and passive, and partly voluntary and active." Hoffding (*Psychology*, 1891, p. 315) distinguishes between the two classes. Maudsley, *Physiology of Mind*, 1876, p. 312: "It is an obvious distinction to make between involuntary and voluntary attention, the interest of the object or subject forcibly soliciting it in the former case, while it is said to be directed by an effort of will in the latter case." Ribot, *Psychologie de l'Attention*, 1889, p. 3: "There are two well-distinguished forms of attention, the one spontaneous, natural; the other voluntary, artificial." Stout, *Analytic Psychology*, 1896, i, p. 180: "Attention is the self-direction of the mind to an object." Sully (*Human Mind*, 1892, i, p. 164) says of voluntary attention that it "is marked off by a clear idea of end or purpose." Wundt, *Grundriss der Psychologie*, 1896, p. 245: "That condition which is characterised by peculiar feelings, and which accompanies the clearer apprehension of any psychic content is called attention."

According to the views submitted in this chapter, the characteristics enumerated in the above list are of no more scientific value than differences of stature in human beings. The organic flux in thought and action, by excluding this and including that, necessarily implies "predominance," "fuller presentation," "clearer apprehension," "heightened reaction," "concentration," and the like. It would be interesting to have it defined when "concentration" or "predominance" are absent.*

25.—THE MEASURE OF ATTENTION IS ITS EFFECTIVENESS.

We conclude, then, generally, that the sole measure of attention, as far as a particular field is concerned, *e.g.*, this page, is what is immediately given of that field, and that felt strain, desire to attend, or attempts to attend, are not a measure of attention. A desire to attend may or may not be followed by the desired attention; an attempt, however desperate, may equally fail.

Let us add an illustration, so as to make the trend of this section plainer. The novice, in his struggles to follow a demonstration, succeeds but casually, the main portion of his energy being spent, as a matter of fact, in other directions. When, at last, he has grasped the matter thoroughly, he turns to it with ease, and attends to it more than previously, without any waste or friction in the effort to attend.

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* To this, Külpe (*Zur Lehre von der Aufmerksamkeit*, 1897, p. 31) replies: "I cannot recall ever doubting whether in a special instance I was attending or not." I would suggest that not casual recollection but conscientious experiment should form the basis of a serious statement.

26.—ATTENTION HAS NO FOCUS.

Normal, as distinguished from keen and lax, attention allows of elaboration without our observing any appreciable strain or noting any restlessness. Imagining this normal strain as a centrally placed point in a line of points gradually thickening from left to right, X . . . Y . . . Z, we obtain towards X a lessening of the strain, and, towards Z, an increase of the strain. [*Test your capacity.*] The one end like the other is quickly reached. We soon cease to perceive, and we rapidly become incapable of further scattering our thoughts. By our very organisation the pendulum of attention ever tends to rest at Y, and this tendency we cannot counteract except by violent means, and then only fitfully. Under normal circumstances, we *must* attend, *must* burn up the normal allowance of fuel, *must* "move on." * What we have stated implies that there is no precise point which we may call the focus of attention. While writing now, there are some details which I but just distinguish, others which require normal effort, others which demand sensible strain, and still others which I do not observe at all. [*Describe minutely such an instance.*] The totality of my present sensations and images is the result or the equivalent of neural processes of a complex character. Throughout life we always, at one and the same time, attend more to some details and less to others. Even in studying the book referred to, some of the energy went into the act of reading. If we try not to attend at all, we are soon forced to attend; and if we make a supreme effort to fix the attention, we only succeed to a very limited extent, and for a brief period, and that effort narrows the field of attention proportionately. Details, which we should have perceived normally, escape us, when the limited field of attention is already occupied.

27.—ABNORMAL ATTENTION.

Under ordinary circumstances, as we have seen, the total amount of energy, as well as the rate of its expenditure, is nearly constant in the human being. A consideration of abnormal instances will bring into relief the normal state of attention, and yield further proof of the probable correctness of our interpretation.

We are usually awake for about sixteen hours, and asleep for about eight. During sleep the senses are apparently inactive. The noises in the room and in the street, as well as other stimuli, have ceased to appeal to us. Taking the case of dreamless sleep, there is a considerable decrease in the total energy to be expended, *e.g.*, waking in the night we feel drowsy, and thought as well as locomotion encounters opposition. There is in sleep no need urging us to attend to what is going on about us, and hence it is impossible that ordinary stimuli should affect us. As we have seen, it is attention or neural activity which transforms the unintelligible into the intelligible; and as attention is absent there can be no intelligible apprehension. In the waking state, only a fraction of what takes place is assimilated by us. In the sleeping state, even that fraction is ignored; and this is not because of our being absorbed, but because of a reduction or a diversion of neural activity. As far as appreciable systems are concerned, we meet with death in deep sleep. Central activity having lapsed, sensations have ceased with it. The life of thought is there only potentially, or in a rudimentary condition. Probably only the very faintest feelings exist. We meet with a parallel to this in the waking state. Sometimes, through ill-health, we are in a perpetual doze. [*Describe such an instance.*] We hardly integrate anything, or think about anything. There are no reactions worth speaking of. In deep sleep there is a further lowering of this dozing state.

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* As early as Locke this was recognised. He says: "Hinder the constant succession of fresh [ideas a man,] I think, . . . cannot, though he may commonly choose, whether he will heedfully observe and consider them" (*Human Understanding*, bk. 2, ch. 14, sec. 15). So Hamilton, *Metaphysics*, ed. 1877, i, p. 247: "We may close our ears or shut our eyes; . . . but we cannot, with our organs unobstructed, wholly refuse our attention at will."

In dream-sleep attention is at work at a level which is usually below the normal. Nevertheless, since to see or imagine involves central nervous processes, the forms and figures of dream life are as truly creations as the forms and figures of waking life. Still, in dream life there is almost invariably little connection between the thoughts, the most superficial suggestions appearing to be on an equality with the gravest considerations. [*Verify this.*] All that requires appreciable effort is missing in dreams (ch. 10).

In fainting we have a similar instance to that afforded by deep sleep. The amount of attention or neural activity present is almost nil, the result being that nothing is observed and that motion ceases.

The phenomena of hypnotism, considering the psychic aspect alone, resemble those of sleep, only that dreams are suggested to the "subject." The deafness and blindness of the latter are occasioned by attention being absent as far as all but the suggester, or the things suggested, are concerned. In proportion as the "subject" has visions, so far is he attending. The very fact that he imagines anything which for him possesses colour, sound or temperature, is conclusive proof, as we have seen, that his brain is busy, that he is elaborating sense elements.

Thus sleep, dreams, delirium, insanity, and other abnormal states, find their explanation in what has been said in elucidation of the normal process of attention.*

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* Prof. Hibben has an interesting article on "Sensory Stimulation by Attention," in the *Psychological Review*, 1895, in which he analyses abnormal cases where the attention factor is prominent. Of one case he writes: "Whenever the subject is one especially interesting to her, she hears without great difficulty; but whenever there is no interest in conversation it is with greatest difficulty that she can be made to hear at all; and it is impossible to gain her attention by any sounds, however loud, if she is engrossed in any

28.—THE LARGER WAVES OF ATTENTION.

The quantity of attention, in the waking state, is, as we have learnt, normally always the same in all normal persons. It might appear from this that we could at any time attend continuously along one line; but this is not so, for protracted thought in one direction tires, though we can freely continue our thought in other directions. [*Notice such cases.*] In accordance with this we find that in ordinary life the topics of thought change considerably. We also generally tend to pursue a subject only for a limited time if that subject requires much thought, and we incline to recur to it repeatedly rather than follow it without pause. Neural functioning, in conformity with the spatial nature of the brain, or as the result of other neural factors, tends to change its direction at intervals. Hence we become tired of one subject, and yet find no difficulty in busying ourselves with others. It is, therefore, profitable to allow for pauses in our thinking. Instead of imagining attention in time as a smooth sea, we have to look upon it as a stormy one where the surface consists of huge waves. These waves, which form the ocean of thought, represent the several subjects which constitute the field of attention in time, and the largest waves are constantly broken up, so as allow others to form. Or, we may say, that as the blood is propagated, not in a steady stream, but in waves, so in attention, or neural functioning, advance proceeds by pulsations.

29.—THE SMALLER WAVES OF ATTENTION.

Yet even this account misses a portion of the truth. The following is, for instance, observable when the attention is turned fixedly to a single aspect of an object. Sometimes, try as we will, we keep on attending afresh instead of attending uninterruptedly, as we desire. At other times we succeed in attending continuously, and then our look [*after how long?*] develops into a stare, and what we are observing loses all intelligibility. (Sec. 19, first conclusion.) In normal life we ceaselessly pass from detail to detail, for persistent attention to one detail, as in hypnotism, produces vacancy or non-attention. (Secs. 220 and 232.) While, therefore, normal attention tends to wander from subject to subject, it also tends to be rapidly moving within the subject from one detail to another. There are, in other words, larger and smaller waves of attention. When we dwell on a subject, we consider the several items of which it is composed. When we study a detail beyond a few moments, a vacuum results. Attention is like a river; it cannot rest; it must report progress. If the larger waves represent the subjects of thought, then the minute ripples which cover the whole surface

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absorbing task or play" (p. 370). Stout (*Analytic Psychology*, 1896, [illegible] pp. 188-9) writes of himself: "I am somewhat deaf, and when conversation is going on among a considerable number of persons I am usually unable to hear anything which is not directly addressed to myself with a distinct utterance by my immediate neighbour; all the rest of what is being said around me is a confused murmur. I sometimes find, however, that if any one even at some distance from me happens to refer to philosophy or any other subject in which I have a keen interest, his words disengage themselves from the chaos of sounds and fix my attention."

of the stormy sea represent the essentially dynamic property of attention. Attention, like all work, is movement. At every instant we have to pass onwards, and we halt only as long as there is something for us to do.[*]

30.—NARROWING THE NORMAL FIELD OF ATTENTION.

Let us begin with an illustration. It is some time since I visited a certain friend. As I enter a street near that friend's house, I see his terrier who used to accompany me on my rambles. I shout across the road "Cæsar." The dog instantly turns. His head and neck, his limbs, his tail, his whole body, in short, appear rigid and motionless. His eyes are vacant. His breathing, I suspect, has almost ceased. After a few moments the eyes suddenly brighten, the body becomes a volume of living springs, and the dog bounds over to me. I am recognised by him. My voice apparently has struck some familiar chord, for else he would have taken no notice of my call. His whole being, we may say, has been sucked into the whirlpool of a known voice. The available attention, under these exceptional circumstances, was centred on one detail. From his stiffness and his blank gaze, it was clear that all central activity, except that of deciphering my personality, was absent. His eyes, his ears, his nostrils, his imagination, struck work. Energy was sorely needed in one direction, and was, therefore, withdrawn from other directions.

In this instance the field of immediately traceable activity was reduced almost to zero. There was not merely an exchange of one field for another; but the second field had almost no dimensions. The attention machinery, which would normally produce a certain quantity of immediately traceable detail, was working subterraneously. We meet here with purposive vacancy. Compared with ordinary thought, we miss subject, points of subject and sense elements. Otherwise there are but confused feelings to make up for the extraordinary shrinkage of the view; perhaps even these are absent. It is a narrowing of the traceable field of attention with a corresponding reduction of traceable activity. [*Examine such cases carefully.*]

Such shrinkage is produced on various occasions, notably: (1) when we are trying hard to re-collect something; (2) when we put a difficult question to ourselves and insist on obtaining an answer; (3) when we attempt to grasp an intricate problem, as in the case of understanding what we read; (4) when we wish to think of a subject under unfavourable circumstances as in ignoring a conversation going on around us; (5) when we slip into bed, close our eyes, and make ready for sleep; (6) when we are subjected to long-continued and monotonous stimulation, as when the hypnotic state is induced; and, lastly, (7) when we are on the *qui vive* as regards some matter, as in endeavouring to hear whether a nightingale is singing in the distance. [*Test the whole list and add to it.*] In all these instances our neural system is like a stretched elastic band which has a strong tendency to return to its normal condition. If we persist in such an attitude for long, we invite headache and dizziness. Usually, therefore, our attempts are consecutive; but even then frequent trials, at short intervals, to narrow the field of attention defeat themselves.

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[*] As to certain minute oscillations of the attention, as when listening to a just perceptible sound, see especially Münsterberg, *Schwankungen der Aufmerksamkeit*, Beiträge, 1889, Heft 2; also Hylan, *Fluctuations of the Attention*, 1896 and 1898; Urbantschitsch, *Pflüger's Archiv*, 1881 and 1882, and *Centralblatt f. d. Med. Wissenschaft*, 1875; Cook, *Fluctuation of the Attention to Musical Tones*, 1899; and, in Wundt's *Phil. Studien*, Lange (1887), Eckener and Pace (1892), Marbe and Lehmann (1893).

31.—EXPANDING THE NORMAL FIELD OF ATTENTION.

The normal field of attention may be narrowed. May it also be expanded? That does not appear possible. [*Challenge this statement.*] Suppose that we desire to observe all that is passing around us. We act accordingly, and we soon learn that no appreciable growth of the field of attention has taken place. What happens is that we quickly fly from detail to detail, the peculiar excitement favouring retention of what is observed. It may be, however, that excitement induces a more than usually voluminous and rapid flow of thought.

32.—BRAIN AND MIND.

Assuming that the brain resembles the other portions of the human organism, then what we have stated in the four preceding sections is in accordance with what we should expect. Take for an illustration the arm. The same human being, at his stage of development, puts forth about the same exertion. Strenuous and monotonous exercise of the arm tires, while different parts are readily employed in succession without consequent fatigue to other parts; or, what is the same thing, the arm, after being tired with one kind of work, easily performs some other task, because different muscles are called into play.* Thus the larger as well as the smaller waves of attention find their explanation on the physiological side, in the structure and arrangement of the nervous system. Also, when the current of attention is stayed, we find the reason in the absorption of the attention in certain nervous work, the correlate of which is the re-membering some fact or answering some question. [*Test the above illustrations.*]

The differences between muscular and neural work are similarly explained. While the size of the muscles varies considerably from individual to individual, and from infancy to manhood, the brain soon ceases to grow, and varies only to a trifling extent between individual and individual.† Hence we should expect the field of attention to vary little in the individual and in different individuals, and this expectation is justified by the facts which our inquiry has elicited. The brain is also an essentially active organ, and hence we always tend to move forward. The psychology completely agrees with the neurology.

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* So Foster, *Physiology*, part 3, 1897, § 665.

† Weight of male brains: Children at birth, 330 grammes; from 1 to 2 years, 941 grammes; from 30 to 40 years, 1364 grammes; and from 70 to 80 years, 1288 grammes (Quain's *Anatomy*, 1893, iii, part 1, p. 178).

33.—THE FIELD OF ATTENTION.

What is meant by the field of attention? [*Test the contents of this section.*] Let us assume that we wish to lift an object. If it is but an empty matchbox on a table near by, no sensible strain is noticeable. There is no change in the field of attention as a whole, except that *a portion of the total state is mechanically excerpted and made to give way as mechanically to the newcomer.** The greater the weight we have to lift, the greater the strain. Suppose we see before us on the ground a lump of iron marked "112 pounds." We wish to lift it. We have lifted weights before, and we know that much of our strength will be required for the task. Observe how we prepare.† We take a deep breath. The muscles of the body harden. The feet are firmly planted. We assume the most convenient position. We are almost a blank as far as anything but our intention is concerned. Our strength, except that absolutely required otherwise, is spent in prospectively raising the weight, or what is its equivalent. When we are about to make an unusual effort, or are making it, we abandon general thought and observation. If the weight does not demand the whole of our strength, we can lift another weight alongside of it, or we may think about other things. When the object to be moved is but a rose petal, a child may be humming a tune, skipping, and wondering about the nature of a rose petal—all at the same time. (See sec. 25.)

34.—ATTENTION ENERGY AND MOTION ENERGY ARE ONE.

What is true of muscular strain, and the consequent narrowing of the field of attention, is true of neural strain; for the two are one. We have noted how we prepare to raise a heavy weight. An exact counterpart of this is to be found in connection with ordinary attention. Suppose I think that I discern a voice in the wood. I "strain every nerve" to hear. [*Test such a case.*] Am I now attending? I am attending only in the same sense that I am when preparing to lift a weight. The attention is absorbed in the preparation. The brain is becoming supersensitive at certain points. Without this I should fail in my task.‡ If other thoughts do not vanish and if labour is not concentrated, we cannot move a heavy weight, and thus when the field of attention is left unaffected, we cannot attend vigorously in a new direction. [*Is that so?*] The field must change as the attention becomes keen. All bodily motion, like all thought, results from organic transformations. Attention reflects but one class of work which appears now as motion and again as sense.

We have remarked that it is not possible to distinguish between non-physiological and physiological effort; that they are one. It will be as well to enter into somewhat greater detail. The fact usually observed in this connection is that great neural strain excludes great muscular strain (as in the dog trying to re-member), and that great muscular strain excludes great neural strain (as in lifting a heavy weight). When attention is rapt, all outward motion is suspended; and when we are engaged in severe physical work, thinking must be discarded. One fund of labour is expended in one direction, be it of thought or of action, of brain or of muscle. This might be disputed on the ground that a man may be strong in muscle, while his neural powers are indifferent. Thus it is, for instance, rightly contended that muscle training, as such, no more strengthens the nervous system than neural training, as such, strengthens the muscles. The distinction is, however, illusory, for what is true as between neural and muscular activity, is equally true within these two departments. As I attend with ease to an elaborate piece of music, and am perhaps helpless when it is a question of grappling with a mathematical demonstration, so I can be physically strong and effective in one direction, and weak and ineffective in another. Assuming the normal state, the slightest muscular effort interferes as truly with neural effort as the greatest, and *vice versa*, just as any neural or muscular exertion in one direction tells respectively on neural or muscular effort in every other direction. [*Is this not too sweeping?*]

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* This fact, if it be one, contradicts the current theories, which imply that our condition at any moment is constituted of an indivisible organic whole.

† "There is no attention without previous attention" (Ladd, *Psychology*, 1894, p. 77).

‡ The influence of expectancy is a favourite subject with psycho-physicists.

The analogies between these two kinds of effort are numerous and instructive. We have already observed that in both spheres we can be strong or effective at one and the same time in a few directions only. We add that great strength or effectiveness in one direction is normally excluded in both departments unless we are healthy in every way. In physical exertion, too, strenuous exercise plays the same part as in neural exertion. In the former, as in the latter, the output of labour must be measured by effectiveness, and not by felt strain. Thus, again, certain parts of the body may be tired, while others are not. These various correspondences suggest a common cause, for they are far from being superficial or accidental.

Men often learn that, after practice, they frequently perform a muscular act in spite of themselves. Thus wishing to raise my eyelids for the purpose of removing a speck of dust from the eye, I meet at first with stubborn resistance on their part. [*Repeat this experiment.*] Again, as physiological acts are attempted more and more frequently, so we often lose control over them. In a similar way, control in matters intellectual becomes frequently impossible, trains of thought continually passing across the stage with apparently no volition preceding them. All that we are entitled to conclude in such cases of uncontrolled activity is that changes are readily initiated in those directions. Involuntariness of actions offers no ground for a division between neural and muscular activity. ***Apparent unconsciousness of activity, ease and readiness of activity, independence and continuousness of activity, hold good as much in the muscular realm as in the neural,*** as might be proved by a profusion of examples, and these states can, therefore, not be considered as distinguishing neural from muscular activity. Waking during the night, I am unable to dismiss an absurd dream; having seen a loathsome sight, I am unable to banish the surviving image; having felt strongly, I am unable to calm myself; laughing, I am unable to regain serenity; thinking intently of a subject for some time, I am unable to dismiss it; being tempted I cannot resist; etc., etc. [*Test these assertions.*] The chief instances are perhaps supplied by our general habits which are yet so little known even to the specialist observer (ch. 3).

35.—ATTENTION AND HEREDITY.

The general nature of human activity—the mould into which it is cast—is determined by the organism we inherit. We readily attend. There is no need for schools where we shall be taught to distinguish, to see, to act. This power, on the whole, the organism takes over from the past. We spring into life, as regards the building up of the inner and outer world, as Minerva sprang from the head of Jove—armed from head to foot, though the equipment differs with different species of animals. The infant pigeon employs its wings to regain equilibrium; the kid jumps about and is frolicsome, unlike its adult parent; the chicken flies up to escape a rat; the gosling placidly rests in the shallow basin full of water.* Again, our customary movements are so complex that, apart from predisposition, we could not have learnt them. Uninstructed attention in this wise performs that which years of elaborate training could not accomplish, while education only enables us to avoid a little friction here and there. Our acquired activity, compared with that inherent in the organism from birth, is like that of the shopkeeper who polishes and arranges his newly arrived goods, education being to heredity what the individual is to the race. The same stimuli occasion the child or young animal to spend energy in varying grooves of action. The discharge of energy, in one instance as in the other, is along certain well-established lines. No one who has closely watched the development of a human being can escape being struck with the large proportion of wisdom which the new-born child brings with it. [*The advanced student should keep a record of the development of some child.*] An infant is not a piece of clay, and what tuition does, is as nothing compared to what the child knows and does without tuition. Apart from the child's latent powers, and its magnificent nervous system ready to develop, it would be as little amenable to education as a snow-man. The full-grown person, too, is mostly himself and acquires from others little which is fundamental. The very depths of his being he has brought with him, his special impressibility being the result of his special organisation. What is easily admitted as being true of muscular activities is equally true of neural activities. Here also study shows that acquirements constitute an insignificant fraction of our outfit, as regards fundamentals, though education has enormous practical bearings.

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* "The twilight that sends the hens to roost sets the fox to prowl, and the lion's roar which gathers the jackals scatters the sheep" (Ward, *Psychology*, 1886, p. 42, col. 2).

36.—OBSERVATION AND ATTENTION.

The limited quantity of bodily energy which can be devoted to neural functioning, explains the varied quality of observation, both inner and outer. A man lives in the country, and scarcely knows the shape of a single kind of leaf. [*Verify what follows.*] Raising my eyes, the sycamore tree under which I write is guessed at rather than seen, while the other trees in the background appear still more indistinct. I meet with considerable difficulty in discerning a single leaf in full, for in most directions I can only see shapeless green patches. In a few places alone, though I am but a few feet off, can a leaf be clearly distinguished. To observe a leaf unmistakably, means that we observe it in preference to others, that we assimilate its structure, its size, its form, its colour, and the relation of each of these to one another and to the whole. Besides, the shapes vary somewhat, as with the ivy, for instance; they also differ with the season in colour and size; and caterpillars, and sundry other factors, give rise to additional changes. If we wish to know more of the leaf, we must, in a critical manner, compare it with other leaves. Usually there is no attempt to attend carefully to any object; for, in the instance we have cited, such attention would imply that we stood still, that we had procured a convenient number of leaves, and that we had scrutinised them until we had satisfied ourselves as to the nature of the normal leaf. Glancing at trees in passing is inadequate for such purposes.

As I walk down a lane at the end of June I note a wealth of grasses and flowers along the roadside; but no glimpse can give one a reasonable notion of even a single blade. As the average person observes superficially, it follows that he has a scanty knowledge of botany and of things in general. He usually glances at the shape or colour of some leaf, and forgets it as quickly.

In seeing a small square □, we see something primarily given in space. But with the majority of objects, time enters as a salient factor, *e.g.*, a daffodil is a continually changing object, and to know this flower well we must observe in due order the changes through which it passes. [*Watch the growth of some flower.*] Fresh knowledge can only be acquired by strenuous endeavours, and when we neglect being strenuous, what is before us remains imperfectly known to us. If the outline of a tree strikes me as familiar, I already know something of that tree. If I can tell the name, size, shape, colour, structure, function and development of its leaves, branches, trunk and roots, then I know just a little more, that is all. There is only a question of degree in attention, or in the result of attention—knowledge. From the standpoint of attention there are ever higher syntheses; and, similarly, lower and lower. The vaguest feeling varies only in complexity from the most elaborate conception. We are constantly passing up and down the ladder of knowledge. The wildest dream, in its several portions, has consistency, and the most careful thought has simply more of this consistency.

37.—The Growth of Knowledge Complexes.

At this juncture let us, from the standpoint of attention, trace the growth of knowledge complexes.

A man, say, often travels to a metropolitan station. The ticket collector there sees thousands of people pass by him whom he could not recognise if they presented themselves a few minutes later. How is it that he knows the man we are thinking of: his easy gait, his indifferent bearing, his peculiar voice, his dress, and most of his features and ways? Perhaps the man passed the ticket collector a score of times before he was noticed at all. Then some trifle, in an idle moment, caught the official's eye. Next time, when he observes that trifle again, he dimly re-collects that he has seen it previously. He connects it with the man, some vague personality. Then he takes account of the walk, then the bearing, then one of his features, then another and still another, then he hears the man utter a few words, then he becomes acquainted with his temper, his manners, the newspaper he reads, and the like. If we suppose a typical instance, the ticket collector's knowledge complex slowly grows. His attitude, as we have repeatedly seen, is that of restlessness. He notes some detail, and has it impressed upon him by repetition. Some waste of attention being thus avoided, he comes to be familiar with a second point; then with a third; and so with a fourth. His conception grows in this way for years. At the same time, the growth is not dependent on any express desire to possess a clear notion of the man. This case serves as a simple illustration of the development of a knowledge complex, stimulated mainly by the necessity of paying attention to unfamiliar details, and aided by the fact that when the attention is directed to the unfamiliar it gradually becomes familiar.

A striking instance of a similar character exemplifies the same principle. Some one is introduced to two brothers, who appear to him so very much alike that he cannot distinguish the younger from the older. In time he comes to know each intimately, and he can then scarcely conceive how he could ever have confounded the two. Their every feature, their every movement, their manner, their voice, seem peculiar to each. How did he come to see them in such a different light? He was in their company a good deal. Meeting them frequently, their appearance grew familiar and sharply defined. The constant play of attention selected detail after detail, and memory treasured these up. The homogeneous conception of the two brothers became more and more disparate. In this instance we encounter again growth from the relatively simple to the relatively complex.

Leaves, again, are but leaves to the countryman who walks frequently across a certain part of a wood. His attention employs itself tentatively with the objects surrounding him. In time the leaves of the familiar bushes come, in the fashion already delineated, to be more and more clearly discriminated. The shades of green of the hazel, the blackberry, and the hornbeam, sink into the memory. From bush to bush he feels the differences. As with the shades of green, so with the normal size, outline and structure of the several classes of leaves. He has no express desire to know these intimately; though there may be now and then an interest in this or that aspect. Thus knowledge complexes are built up. He ends by knowing much where he knew little.

So with other objects. Being familiar with the full-grown robin, one finds that one is enabled to recognise, as a consequence, young robins. Knowing these vaguely, the knowledge, through unpremeditated observation, grows more defined, and one can tell the different stages in the development of young robins. In this way a great multitude of knowledge complexes come to be acquired.

Take the book which I was reading. Certain notions were embodied in it. These were not concentrated into a word or two. They had to be abstracted from the perusal of the whole volume. Perhaps the aim of the work is merely to impress one important truth or knowledge complex. Aspects of that truth are, for this purpose, continually introduced and illustrated. As I study the book closely, the central conception slowly takes shape. The same factors are still at work. Certain details, by being repeatedly attended to, grow more and more familiar, and thus separate facets of the truth are gradually detected. Then several of these are seen in relation to each other. At last, as the result of progressive activity, the truth, as such, flashes into existence. The process has been one of development; and attention, in its unobtrusive fashion, has been leading me towards the end desired. By reading a volume several times, more and more is re-membered. Attention is consequently set free, and we grapple with new aspects.

Often the notions latent in a book, or in a person, or in any form of knowledge complex, became apparent without being searched for. Let us say that the author I am interested in is Robert Browning. I read poem after poem, and many a one again and again. If the poet has a marked style of his own; if he shows certain mannerisms; if his stories are worked out in a fashion peculiar to himself; if he has a limited number of ideas which he seeks to inculcate, these idiosyncrasies gradually become transparent. Repetition forces what is like to the foreground; for it is his fundamental notes which he is ever repeating. Hence the memory retains these rather than the incidental items which have not the advantage of being rehearsed, provided that this process is not disturbed by theorising. In time we may know Browning well, without ever having made a deliberate attempt in that direction.*

38.—ATTENTION TO ONE OBJECT AT A TIME.

We have seen that the normal amount of attention is constant. We have learned how familiarity in one direction allows of additional functioning in other directions. We have also observed that attention does not deal so much with points as with fields. Hence we answer the question, "Can we attend to more than one thing at a time?" with a decided "Yes."

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* While in one instance the notion of wishing to know Browning well is present, the same result is yet obtainable by a series of less comprehensive notions.

Indeed, there cannot be a "one thing" to attend to. All functioning implies breadth and plurality, and the field is not even limited to one notion or one act. While I was endeavouring to understand what I was reading, I was, of course, reading at the same time. The latter claimed some of my attention, and I was thus active in two sets of directions. I might have been reading the passages aloud, and walking while thus reading. In addition, I might have been playing with a key in my pocket, and so on. The field of attention is only restricted by the quantity of labour requisite for an act. *Various activities are pursued, separately or conjointly,** *as easily as one, if those activities collectively absorb no more than the normal amount of energy.*

The attention is usually divided, as in the instance just referred to. It seems possible to speak as fast as one can, while, at the same time, reading an announcement on a street hoarding, and inwardly contemplating a landscape. [*Test this.*] Again, in any simple performance, a multiplicity of actions is carried out simultaneously. In lifting a heavy weight I do not need to choose first a convenient position, then stand firm, then adjust my hands and fingers, and then exert a strain. Many of the various movements are normally performed at one and the same time. [*Repeat this.*] The subdivisions of such an action can be again subdivided, if need be, for there is scarcely an ordinary movement so simple as to lack parts. We, therefore, find, as we might have anticipated, that, in learning, we generally proceed only with portions of a process at a time. After a period several portions are performed simultaneously. Sometimes, as in the case of lifting a weight, the activities form one connected whole. At other times, they are disconnected: the walking has nothing in common with my playing with the key, and my playing with the key is not thought of in connection with my reading aloud.

Let us re-member what we have already referred to, that the functioning of the central nervous system is due to the pressure of organic needs, or to functional readjustments. For this reason, if what we are occupied with requires less than the normal energy available, series after series will establish itself until the available energy is fully employed. Hence when we are engaged in routine occupations of a low order, *i.e.*, occupations which absorb little attention, we always add to our immediate *répertoire* of thought or action. As a difficulty in the work arises, so the objects attended to decrease; as the work becomes easier, so we are occupied increasingly with what is not connected with the task. [*Test this minutely.*] In some matters alone do we encounter the fact that we cannot do more than one thing at a time. I cannot, for example, sit here writing, and be, at the same time, strolling through the neighbouring wood. Such instances, however, prove little. Only a few days after I had written this, I overheard a remark illustrating the view which is here put forward. A builder said somewhat sarcastically to one of his men, as I was passing by, "You wouldn't do for a carman; you would pull up the horse every time you wanted to speak," plainly intimating that the man might do his work and talk at the same time. Of course, an untrained psychologist would be confused if he attempted to do deliberately what he constantly does without pointed deliberation. But time will soon prove to him that introspection is not bound to be a barrier to the direct observation of immediately traceable facts. As practice proceeds, he will be able to institute an "introspective series."

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* Stout (*Psychology*, 1896, i, p. 212) says that we can only attend simultaneously to the ringing of a bell and the swinging of a pendulum when the two are connected in thought. This is certainly not so with me. While I am continuously speaking, I see at the same time the trees outside my window and hear the tram cars passing by, without connecting these three processes.

The problem involved in this section has been much debated. Brentano (*Psychologie*, 1874, pp. 204-32) holds that several things can be thought of at once, but they must form one whole. Hamilton (*Metaphysics*, 1877, i, p. 254) contends that five or six points can be discerned simultaneously. James (*Psychology*, 1890, i, pp. 405-9) seems to me ambiguous. Lipps (*Grundtatsachen*, 1883, p. 164) believes that "only one process of thought can proceed at a time without interruption." Paulhan (*La Simultanéité des Actes Psychiques*, 1887) recounts a number of most interesting experiments of his own which tend to prove our contention. Stewart (*Elements*, 1808, ch. 2) considers, as we have seen, that the *minimum visibile* is the time-atom of thought. Stout (*Analytic Psychology*. 1896, i) concurs with Brentano and Lipps, saying, in explanation, that "each mode of mental process tends to arrest and suppress others" (p. 196), a conclusion with which I cannot agree. The fact that effective introspection is generally denied, implies that thought is considered only one storey high.

39.—Do we Attend in Habit.

This is not the place to face the question of routine; that is dealt with in ch. 3. We can here only consider the problem from the standpoint of attention. As an illustration take the compositor who is setting up this type. [*Examine in detail some process familiar to you.*] If he is not introspective, and he is asked how he does his work, he will be unable to re-collect more than a minute portion of the process. Why is that? It is because he does not, now at least, think of the different parts of the process as a whole and in relation to other things. He only regards the steps in connection with those that immediately precede and follow. Through continued improvement he has become an adept in doing the right thing at the right time. Being uninterested in the nature of his work and interested in other things, he has a tendency to crowd out of the total process whatever can be spared. He busies himself only with that which he is compelled to do, being employed otherwise in reflecting over pleasanter, and to him, more fascinating themes than setting up type. The gathering thoughts push aside all that they dare. As a result, attention to the work is reduced to a minimum. He just re-members what is necessary —no more and no less, roughly speaking—and what is not necessary falls a prey to oblivion. Each movement is involved in the one which precedes it—it being immaterial here whether the stimulus is central or not—and is entangled in the following movement. As these movements are of no general interest, as attention to them is reduced to a minimum, and as the main stream of thought rushes by them, they become lost to the memory under ordinary circumstances. Assuming that the compositor has duly learnt his art, his knowledge, through economising the attention, is reduced to what is indispensable. That he attends to his work is plain. From a number of letters in a box, he selects the one which lies in a certain position. Previous to that selection his right arm moved towards the proper box. If he shut his eyes, he would soon find out their use: if he then lost the sense of touch, he would be unable to proceed. Sensations, images and movements, are the result of attention, and since they occur in the process, the compositor must be attending. Or, to test the matter differently. If the compositor is so inclined, he can observe what he is doing, and thus re-develop the various steps in order.* In noting his own procedure, he will soon be convinced that he is busy attending during the whole process. Again, let the compositor be interested in a conversation, let that become absorbing, and his arms gradually come to a standstill, which proves that attention covers the whole field of organic functioning. No process is so elementary that it escapes falling under this rule.

40.—CAN WE ATTEND TO HABITS.

A misconception has been created by the opinion that it is not possible to attend to a habit without influencing it. Only casual observation bears that out. It is true that with some activities the first attempts at following the process modify it or give rise to perplexity. More critical study, however, shows that the embarrassment soon disappears, and that after prolonged practice we can fully observe without in the least degree introducing any change. At first, in following the process, we incline to divert the labour requisite for the process itself, which produces disorder. We are also apt to introduce crude notions, or deliberately fix our eyes instead of allowing them free play; and the like. But as we continue striving to attend to the manner in which we perform a task, less labour is wasted or misdirected, and the two pocesses of performing a task and of attending to the manner of performance proceed together., In some instances, besides, it is essential that we "attend" to our work. In others, we freely attend to our dress, to our looks, to our walk or to our conversation, *e.g.*, we not only converse, but we take note of how we converse.† [*Practise till you can readily observe your habits.*]

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* Stewart (*Elements*, 1808, ch. 2), believes that we attend in habit, only that our thought is much quicker. Dr. Stout (*Analytic Psychology*, 1896, i), with the majority of psychologists, excludes attention from the realm of habit. He holds that "independence of attention" is one of "the chief features of permanently fixed habit" (p. 258); that 'established habit is independent of and exclusive of attention" (p. 261); and he tells us further that "a practised reader does not usually attend to the letters and words; his thoughts are occupied with the meaning" (p. 206).

† Stout (*Analytic Psychology*, 1896, i) strongly maintains that in attending to habit, "habit is disturbed; there is loss of facility, rapidity, and uniformity" (p. 261).

41.—THE ROUTINE OF LIFE.

Besides the routine of work, there is the routine of life. In daily life we pay but a semblance of attention to the objects around us, because they suggest nothing of interest, and because, if severely attended to, they deprive us of the normally necessary attention. Thus we do not linger over each letter in a book. Similarly, in town we take little account of carts, horses, houses, names over shops, or the people we pass, and we notice only in the vaguest manner the stones on which we tread. In the rumbling of wheels we distinguish neither wheels nor rumbling. If again, in strolling through a maze of trees in June, I did not ignore the majority of the surrounding objects, I could never think of anything else but objects connected with the wood. The opportunities at our disposal being limited, we attend only to an inconsiderable extent to our surroundings, and these hurried observations being useless, or nearly so, for the general stream of thought, they are little dwelt upon, and hence not re-developed. For example, every one has noted the moon in the sky, and also the fact that she is sometimes full and sometimes not; but her exact path, the rate of her speed, the reason for the changes, are not revealed by an occasional upward glance. There must be consistent, connected and long-continued activity to discover these facts, and this, in contradistinction to routine observation, holds of the main facts of existence.

42.—ATTENTION AND MEMORY.

In the routine of work and of life we meet with attention. Turning to memory, we are face to face with the same factor. To remember, according to our interpretation, is to "re-member." The traces of the original stimuli are preserved in some form, if they were attended to in the first instance, and attention converts the modification into some image, etc. Without somatic or bodily stimuli, attention as we have seen, can do nothing, and without sensory attention such stimuli create no sensory effect. Hence we are bound to reason that in re-development we apply energy to traces left by the original stimuli.

The moment the processes comprehended in attention come to a standstill, form, totality, sound and colour, cease to exist for us, while with the birth of attention, objects are realised in the manner already explained. Hence the sensory world, as we know it, does not exist apart from attention. Accordingly, *no image, no sound, no taste, no thought, nothing intelligible is stored.* (Sec. 15.) As long as attention is at work, so long do secondary systems exist. We re-develop everything, in the sense that we have developed it previously. The process of memory, like that of sensation and feeling, is one of elaboration, only that in the former instance we are dependent primarily on central stimuli. The objects of possible memory are latent in the brain structure as a tree is said to be latent in a seed, and possess no other existence. Attention makes real what is otherwise only possible. We have no more reason to believe that images exist in the absence of attention than that a blind man can see, or that a puppet will move if the strings are not pulled. Our needs (ch. 7), coupled with the trend of attention (sec. 44), decide which out of innumerable possibilities shall become actualised.

No strict line can be drawn between primary and secondary systems, or fact and memory. Most objects integrated are not integrated at once, *e.g.*, in viewing a landscape I view now one part, now another; my eyes sweep across it; and were it not for apposite memories the impression would be far different. Thus even the simplest figure takes time in apprehending. Again, listening to a conversation, an argument or a melody, is a meaningless process except in so far as we connect what happens from moment to moment. Were it not for memory, feelings and sensations would be impossible.* (Ch. 5.)

43.—SUB-CONSCIOUS AND UNCONSCIOUS THOUGHT.

As with memory, so with unconscious or sub-conscious happenings. Thought being impossible without attention, there can be no attentionless thought, and consequently no unconscious or sub-conscious thought, if these presuppose absence of attention. The subtle facts which are said to mark subterranean thinking must be explicable in the light of what we have learnt. Here the relation can only be hinted at.

First, we must allow for misinterpretation. Images are often so faint, and so little dwelt upon, that we forget or are unaware that they occupied the theatre of thought. Feelings, again, are not seldom misconstrued and often not actively discerned. These classes of facts might be conveniently called sub-conscious, or loosely connected, if it be observed that we only refer to facts which are much misinterpreted or little dwelt upon.†

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* Smith, *The Relation of Attention to Memory*, 1895.

† Morgan (*Psychology*, 1894, p. 14) would restrict the word "sub-conscious" to the margin of consciousness as distinguished from its focus. Stout (*Manual*, 1898, p. 68) defines sub-consciousness as one with sentience. Sully (*Human Mind*, i, p. 75) also inclines to use the term as we have done. Lipps has a curious theory as to unconscious activity. He says: "All psychic activity is primarily unconscious. Out of the multitude of what is unconscious rises the conscious when the conditions are favourable" (*Grundtatsachen*, 1883, p. 695).

The words "consciousness" and "awareness" express a simple fact which is rather hidden than revealed by these two words. When I say that I was fully conscious of the course of action I took, I mean that I connected the course of action with some other fact. When I say, on the other hand, that I was not aware of what I was doing, I mean, again, that I did not connect the course of action with anything else. Consciousness or awareness thus means that a notion does not stand by itself, but is connected with some other notion or notions. Whenever a notion is thus palpably connected with some other notion, and only then, do we speak of consciousness or awareness. For this reason it might be best to vary those two words with the more precise word Connection. Hence we may say, "The course of action was closely connected with certain reasons for such course of action," or briefly, "The course of action was closely connected." Likewise we may say, "What I was doing was not connected" with any notion. Hence though it is a sacrifice to dispense with two such well-known words as we are here criticising, it will be found a useful innovation to say, "I connect this," "I do not connect that," in the place of "I am conscious of this," "I am not aware of that."

Having translated the term "conscious" into that of "connected," we are justified in re-defining another obscure word, "knowing," by the very same term of "connected." Wherever we read "I know," we may read "I connect." Though it may seem curious

Secondly, we are bound to allow for a possible activity of the brain in the absence of any decided feeling element. In this connection we must not forget that attention and stimuli produce a neural activity, the counterpart of which we call thought.

Perhaps an illustration or two will elucidate this problem. I wish to reintegrate the second line of a verse; but after repeated efforts I fail, and turn away from the subject. [*Try deliberately to re-instate things or names which you do not easily re-develop, and note result.*] Suddenly, in the midst of some train of thought, rises the sought-for line, like a ghost out of a gulf. How are we to account for this? Coincidence is out of the question, and sub-conscious thought, in the sense in which we have defined it, we must also reject. These may account for individual cases; but they do not explain the facts as a whole. The line rises spontaneously, unbidden, unsought, perhaps unwelcome.

Here is another instance. I want to know how a certain argument is to be answered. After several unsuccessful attempts I drop the matter. Then some time afterwards the solution develops. What explains this and similar facts? The theory here propounded is as follows. (See ch. 5.) In hard thinking, re-collecting or passion, certain central nervous tracts are supernormally sensitive, agitated or active. When the main stream of attention is turned into a new direction, the activity which has been set going persists for a period, much as vibrations persist after the initial antecedent is withdrawn. A solution, if arrived at as the result of the continued activity, then emerges, as if we had kept on thinking in sense terms.

This theory will be shown, in the proper place (sec. 110), to be more than plausible. It not only gives a rational explanation which accords with the illustrations; but it is also in harmony with general facts. We know how anger or passion clings to us; how a thought which is dwelt upon haunts us; and how moods thus created defy interference (sec. 109). These sudden re-developments are also accompanied by a feeling peculiar to them, which we cannot banish. Sometimes it is distinct; at other times it is only observable when sought for. Thus in the case of re-instating the second line of a verse a somewhat faint feeling clearly accompanied the sensitiveness, implying an expenditure of overground attention. This feeling is strictly comparable to any persisting organic feeling; it is liable to be misinterpreted like others of its kind, and persists like the craving of hunger. Compared with other feelings it shows a difference of degree, but none of kind. Important developments of this theory are possible; but would not

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that "conscious" and "aware" should be identical with knowing, yet analysis supports our statement. I know or I do not know this or that, means invariably I connect or I do not connect this or that. If a name heard, or a thing seen, suggests something or nothing, or is connected with something or nothing, we say ordinarily that we know or do not know this. Psychologically, therefore, consciousness, awareness and knowing, are best expressed by such verbs as to connect, to link, to chain.

We must go a step further. To believe, to doubt, to be certain, are degrees of knowing, and hence interpretable in terms of connecting. We can, therefore, employ "to part-connect," "to semi-connect," and "to connect perfectly," for to believe, to doubt and to be certain.

be in place here. The bare statement must suffice that there are neural processes which at some point end in a more or less complete thought, suggesting a brain activity equivalent to, but unaccompanied by, overground thinking. There is, however, no evidence that anything but shreds of thought are developed subterraneously, and we may dismiss the notion of an "unconscious mind" as unjustifiable. (Sec. 217.)

Hartmann (*Philosophy of the Unconscious*, 1884) explains everything by reference to the unconscious—a brilliant device to escape the trouble of tracing stubborn facts. The Herbartians keep their eager-to-come-to-the-top ideas in the dark cellars of unconsciousness. These unfortunate ideas harass their more fortunate brethren who for a moment breathe the sweet air and see the light of day. The Herbartian hell and heaven are purely mythical. Ward (*Psychology*, 1886, p. 47, col. 2) compares the threshold of consciousness "to the surface of a lake and sub-consciousness to the depths beneath it," without indicating where exactly the process of drowning begins and how it proceeds. Once conceive an idea to be an organic complex (sec. 80), and both Herbartianism and Associationism seem superseded.

44.—CONDITIONS FAVOURING ATTENTION.

We discussed at length the meaning of attention. A few words will suffice to determine the conditions which favour attention.

(1) First and foremost in stimulating attention, always taking for granted the existence of needs, *i.e.*, of functional tendencies, is the presence of an irresistible inclination to attend. A certain quantity of attention perpetually strives to spend itself. Be the interest ever so low, if we are not otherwise occupied, every trifle is likely to enter the avenues of sense or of the imagination. What would otherwise not be attended to receives recognition, because we must be occupied somehow. When for any reason, as on occasion happens, we have nothing special to busy our thoughts with—nothing that stimulates to marked endeavour—then a long caravan of thoughts travels across the pasture lands of fancy, each part of which, as soon as it requires marked attention, is displaced by other thoughts of a similarly ephemeral nature. [*Examine such cases.*] Everything in turn then captivates the inner and the outer senses. The completion of a thought, in these circumstances, depends on the ease with which it may be pursued; and as difficulties are bound to arise in the process, each thought, in the case we are considering, tends to be abruptly displaced. As birds lay eggs, whether these are fertilised or not, so we continue thinking whether there is a present necessity or not. Since some difficulty may have to be solved at any moment, the attention does not slacken. When thinking is not compulsory, our thoughts lack the germ out of which other thoughts evolve. These are the unfertilised eggs which the bird of fancy cannot help laying.

(2) In the next place comes the precise quantity of available attention, as distinguished from its perpetual presence. The latter determines that we shall be active; the former decides how far we shall be active. Thus as routine generally lays claim to but little of the available attention, we have rising tier after tier of thought until the demand equals the supply.

As the dog pretends to be anxious to fetch a stick out of the water when his desire is to bathe, so we often make believe that we are busy with many details when we are hurried along by the imperative necessity to continue acting.

(3) Just as before going to sleep we frequently doze, attention being on the decline, so ill-health often tends to decrease the energy available for functioning. This usually expresses itself in two ways. First, we attend less absolutely. Secondly, the value of an effort is largely reduced, so that no suggestion is pursued to its legitimate issue. In robust health, on the contrary, attention is at its maximum both as regards strenuousness and effectiveness. Hence, other things being equal, attention is most effective in good health.

(4) In our analysis we noted that unfamiliarity offers a barrier to voluminous attention. While the flowers and grasses along a lane are meaningless to one individual, to another, a botanist, they yield a rich harvest of knowledge. This man recounts a score of floral species which he has observed, with much other information, while the former cannot distinctly recall anything. What is most easily attended to, is that which has been attended to strenuously on former occasions. As a magician's wand was said to rear a castle in a moment, so attention, with bewildering swiftness, utilises the bricks and mortar of memory. It sorts, sifts, distinguishes, classifies and re-cognises, a variety of details in a very brief space of time. Attention is, therefore, most effectively employed on what it has been previously engaged upon.

(5) For practical purposes it will not be enough merely to re-cognise, to re-attend. Re-attention is most useful when it is combined with simple attention, or, at least, with attention to something not well recognised. When the comparatively new is involved in the comparatively old, the consequences are most fruitful. In proportion as the new is isolated, so will it be difficult to make it a permanent possession. Thus when new truths stand by themselves, they are hard to assimilate and re-member, while, if they are shown to be part of an old truth, they are often re-instated or comprehended with the greatest ease. For the advancement of knowledge—for effective attention—nothing is more valuable than to show the old in the new.

(6) What is conveniently grasped, other things being equal, is also more conveniently attended to. If an object exhibits a special design; if the parts are correlated; if its scheme is not fantastic; if it is not so small or so large that much effort is required in its examination; if it is of a class known to us, then we readily busy ourselves with it. Thus a fine mansion is easily conceived of as a whole; a name encountered for the first time is yet fluently read by one accustomed to reading; a geometrical figure of regular proportions is not as exhausting to take note of as one of irregular proportions; a picture representing a scene from human life is understood the more readily the more evident the relations of the figures to each other.

(7) *The business of the attention, i.e.,* the business of the central nervous system, *is to serve the organism,* and in this sense attention is teleological. Some demand of our nature, muscular or neural, nutritive or regulative, sets the brain going and, if advisable, keeps it going until the demand is satisfied. Then another want acts as a stimulus, and so forth. This is an abstract way of regarding the matter. We have normally several wants engaging the attention simultaneously; and, as a rule, the want absorbs the attention for a time only, and not until it is satisfied. If a man is fond of strawberries and they are before him, his attention, or part of it, will probably be devoted to the strawberries until he has done with them; but if they are difficult to procure, a little speculation is all which is ventured upon. Our wants are also frequently complex; a man goes for a walk, for instance, because he desires exercise, fresh air, the music of the birds and the sight of flowers. The purpose of neural activity is to satisfy our primary and other needs; but when we are specially eager about one matter, the whole available attention is concentrated on that alone.

(8) When interest is acute, attention is highly effective without any strain being perceived, though the consequences often show that such strain existed; when interest is slight, attention is comparatively ineffective, while the related effort of attention is distinctly felt. In interest there is a rush of available energy towards a certain point.

(9) When interest, for any reason, is absent, *ennui* sets in. We then long to do something. We are uneasy as the result of being unemployed. Adults, under such circumstances, yawn and grow languid, while children cry for something to do. In *ennui* the attention is largely absorbed in uneasiness, as there is no sufficient incentive to make use of it through the accustomed channels. The existence of *ennui* proves, in addition, that the tendency to action is constant, and not solely determined by the presence of this desire or that.

(10) An important aid to continuous attention is to dismiss decidedly and completely the previous thought, and to turn whole-heartedly to the matter to be attended to. If that matter be fairly interesting, the attention will then easily be sustained, and quickly recur to the subject in the case of momentary absent-mindedness. Much of children's inattention is due to the difficulty they find in ridding themselves effectively of thoughts which precede, or arise out of, the lesson.

When I sharply dismiss a thought, I do it usually by shutting my eyelids forcibly; by looking emphatically at some object; or by some other *abrupt muscular* act. The only alternative is to refuse to think, when, after a little while, some casual percept or idea emerges. In any case, dismissal seems due to change of activity alone. It is as if we could only dismiss visitors by inviting others to take their place.

(11) The more the attention is trained, and the more we can appeal to some congenital or acquired predisposition, the more readily are we active in any chosen direction. [*Test* (1) *to* (11).]

45.—The Education of the Attention.

What has been remarked concerning the conditions which favour attention must be considered in education. There are at least three principles to be taken into account.

(1) The attention should be deliberately exercised. No tasks requiring either no sensible effort or a great effort should, as a rule, be imposed, for in both instances the labour is almost wasted. Supposing now that the exercises are rational, we shall discover that what at one time could not be done at all, can later on be readily accomplished. After appropriate practice we glide at will from subject to subject, or row deliberately among the shallows and deeps of one thought. In the education of the attention it is of prime importance to prevent aimless thought, and to develop the power of firmly, freely and fully fixing the attention on any subject we choose. It is not sufficient for us to be trained in certain directions, as mathematics or languages. If no more is done, vast tracts will remain uncultivated. Education must enable the individual to control his activities generally, or rather should aim at perfecting, as a whole, the neural mechanism.

(2) The motive for attending must be detached from special interests, and the supreme notion to plant in the child, as regards attending, is to make it desirous of acting effectively. In other words, the child must be brought to have a strong inclination (sec. 146) in favour of proper attention. The need for reasonable effort should be the incentive. The employment of the attention must be dissociated from the interest in the thing immediately attended to. In all sound reflection there is readiness to attend to what is not specially interesting except as a means to some remote end.*

(3) The training of the attention must begin early in life. Later results are most disappointing.†

46.—Factors Producing Changes in the Field of Attention.

Changes in the field of attention are mainly induced by one of the following circumstances: (1) when attention has attained its end (Stout); (2) when fatigue sets in (Stout); (3) when a strong sensation competes (Stout); (4) when, through lax or overwrought attention, the topic tends to change; (5) when a new or old topic recently thought of, takes possession of the attention; (6) when a word, a tune, a sentence, etc., haunts us; (7) when we are full of anxiety; (8) when attention was due to a mood which is receding; (9) when we attend to various objects alternately; (10) when we dismiss a thought deliberately; (11) when a thought shows signs of tiring, and is not of pressing importance; (12) when we have given sufficient attention for the time being;‡ (13) when in a subject or in our surroundings we observe something of special interest; (14) when some routine duty is to be performed; (15) when, by previous resolution, we are to do something at a stated time, or on encountering something or somebody; and (16) when a feeling of hunger, etc., becomes imperious.* [*Test the list, and, if possible, add to it.*]

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* The Associationist school lays the stress on feeling, interest or pleasure-pain; the Herbartians, on connecting what is new with what is old.

† On the subject of the training of the attention, see Carpenter's *Mental Physiology*, 1876, ch. 3.

‡ We usually devote only a short period at a time to any particular problem.

47.—General Conclusions.

We have endeavoured to discover a satisfactory answer to questions such as the following: Why does attention not vary normally in any one individual or from individual to individual? Why do we normally attend to, or tend towards, something or other without interruption? Why can we increase or decrease the range of attention but to a very limited extent? Why do we reason in subjects, and move quickly from point to point? Why can we not stop attending? Why is attention normally easier when the subject is familiar? Why can we attend to more than one thing at a time? Why are observation and thought slow? etc., etc. Secondary systems or facts of non-bodily feeling have supplied us with no clue to the solution of these questions, and assuming only these, any answer, as long as it was not self-contradictory, could be tendered, each being equally empty. But on turning to the bodily organism, we met with facts of great significance. All activity, we learnt, is apt to leave traces behind. Certain classes of activity are followed by growth of a more or less extensive nature. The organism as a whole varies little in individuals. Development proceeds along well-marked lines. Different parts of the body are more or less active, the heart and the lungs working ceaselessly and uniformly without need of rest, while the voluntary muscles require more intermittent and varied exercise. The brain in the waking state, we know, is an organ which is steadily active like the heart and unlike the muscles. Assuming the central nervous system to be the complement of the laboratory of thought, we saw that all that was evident, and all that was obscure, in the process of attention was readily explicable. Indeed, it became evident that the completest understanding of our nature, the general form of thought, could be arrived at deductively from a contemplation of the body in general and the brain in particular, there being no connected continuity in the secondary realm while there is such continuity in the brain.

48.—A Bird's Eye View.

The term most intimately connected with attention is direction. In attention, therefore, regarded physiologically, we consider the play of neural changes from the point of view of the direction in which they take place. It is not so much change, as the line-of-change, which we refer to in speaking of attention. In this sense the present chapter deals with a certain aspect of cerebral change—with the reasons why neural change tends now in this direction and now in that. Further, since normal activity is subject to interference and has certain characteristics, we speak of the degree and the volume of attention. Attention thus treats of the direction, the degree and the volume of cerebral change. It embraces all activity; its field is the field of activity. Thus the word attention is as useful as is the word direction. It helps us to express the fact that the brain is busy in this direction and not in that; that its forces are massed here and not there; and that in the normal waking condition it functions incessantly, to the same extent and in varied directions.

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* "Attention in any given direction ceases only under one or more of the following conditions: (1) when its end is attained . . . ; (2) when fatigue sets in; (3) when some competing sensation . . . interrupt [s] it; (4) when some sensation or image occurs connected with a system of psychical dispositions which . . . happen to possess . . . a relatively high degree of excitability," *i.e.*, casual associations (Stout, *Analytic Psychology*, 1896, i, p. 197).

From this position it is but one step to a looser use of the term where it sometimes only spells activity or change. Thus when we say that we attend in a certain direction, we mean that we are active in that direction. In this way attention has come to be identical with change and change with attention. In the strictest sense, then, our subject has been the systematic aspect of neural functioning.

We have identified attention with cerebral change. The meaning of our key-word is readily distinguishable from the only other term, besides activity, with which it might be confounded. Willing is divided from attention, and attention from willing in that attention *always is* change and nothing else, while volition *never is* change, but only points to it. The relation between these two is that between being and becoming, between *sein* and *werden*.

Viewing the subject of attention from a still higher position (which embraces the physiological aspect), we say *In the normal waking state something is always immediately given and that something is a constant quantity which constantly changes at a constant rate.* Here the terms attention, activity, functioning and energy, become superfluous. In our exposition, however, we have found it impossible to break with the old terminology without endangering the sense and making comparison difficult. Nevertheless one feels that it is most undesirable to assume some mysterious power or capacity along with what is immediately given; for such a power or capacity describes nothing and explains nothing, and has, therefore, no place in science.

Additional References.—Angell and Pierce, *Experimental Research upon the Phenomena of Attention*, 1892; Angell, *Habit and Attention*, 1898; Angell and Moore, *Reaction-time: A Study in Attention and Habit*, 1896; Binet, *Attention et Adaption*, 1899; Birch, *A Study of Certain Methods of Distracting the Attention*, 1897; Bradley, *On Active Attention*, 1902; Braunschweiger, *Die Lehre von der Aufmerksamkeit*, 1899; Cattell, *Aufmerksamkeit und Reaktion*, 1892; Darlington and Talbot, *Distraction by Musical Sounds*, 1898; Dohrn, *Das Problem der Aufmerksamkeit*, 1876; Drew, *Attention, Experimental and Critical*, (With Bibliography), 1896; Dwelshauvers, *Untersuchungen zur Mechanik der activen Aufmerksamkeit*, 1890; Griffing, *On the Development of Visual Perception and Attention*, 1896; Lalande, *Sur un Effet particulier de l'Attention appliqué aux Images*, 1893; Martius, *Ueber die musculäre Reaktion und die Aufmerksamkeit*, 1890; Moyer, *A Study of Certain Methods of Distracting the Attention*, 1897; Münsterberg and Kozaki, *The Intensifying Effect of Attention*, 1894; Pillsbury,

A Study of Apperception, 1897; Stanley, *Attention as Intensifying Sensation*, 1895; Swift, *Disturbance of the Attention during Simple Mental Processes*, 1892; Ueberhorst, *Das Wesen der Aufmerksamkeit*, 1897; and Uhl, *Attention, a Historical Summary*, 1890.

CHAPTER III

SYSTEMS AS ORGANISED

Habit fashions every act,
Sees that thoughts are closely packed.

49.[*]—THE HISTORY OF A HABIT.

A child is being taught to write.[†] Laboriously he learns by heart the precise appearance of each letter. He does not distinguish between *d*'s and *b*'s, *p*'s and *q*'s. He dips the pen too far into the ink-pot. He blots the paper, and his characters are now too faint and now too pronounced. He forgets to shape the letters properly: neither higher nor lower, neither broader nor narrower, neither thicker nor thinner, than the example. The pen is not held so as to prevent unnecessary work or awkwardness of movement. The paper is placed wrongly and is not kept clean. The arm is not sustained in the particular fashion required, and the general bodily bearing fails to conform to prescribed rules. The necessary speed is not attained. The words are not properly divided. The lines are not at right angles to the sides of the paper. The spaces between these lines are not uniform.

Much that is objectionable, the child picks up by the way, and thus he has afterwards to unlearn what he has injudiciously acquired. Many things the child is told, and some of these he forgets or misunderstands. Here, again, much ground needs to be recovered. When an explanation is proffered, the child has difficulty in following it. He does not at first re-member with ease. He often stops trying to re-collect something he has forgotten. He suspects that he is wrong. He doubts. He argues with himself. He asks questions. He corrects his writing. He watches the movements he initiates. He observes what progress he is making, and imagines what teachers, parents or fellow-pupils will say. He repeats to himself: "I mustn't hold the pen so; I must hold it in this way." "That letter falls below the other letters of the line." "This letter I wrote all right." "Oh! look at that blot!" "I wonder whether this is right." "I wish I had finished." [*Acquire some habits purposely, and follow to the minutest detail the process of development.*]

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[*] Organised reaction, organised trend and organised activity are used in this chapter as equivalents of routine process or habit.

[†] The example of the child learning to write has been chosen merely for the purpose of illustrating the nature of habit generally.

Many years after the child has finished his lessons, we meet a person who writes easily and well. This adult is the whilom child who found learning to write an arduous task. That accomplishment is no more a problem to him. He proceeds now without apparent effort. How shall we account for the surprising change? To this question I propose to seek a satisfactory reply.*

50.—MEMORISING THE FACTS.

(1) In learning to write, various facts came to the child's notice, and these he was asked to retain. Through instruction, through both deliberate and chance observation, through interconnecting or reasoning, the facts were collected item by item. Committal to memory gradually made re-collection of the material to be utilised perfectly easy. After the lapse of a certain period the child knew that which the man knows. As soon as any detail was required, it instantly developed.† Having what is relevant firmly established in the memory, there is never—or almost never—a need to doubt, to argue, to cast about or to try and remember. [*Observe this phase in your habits.*]

(2) A variety of accidental difficulties embarrasses the learner. There is a blot—how is he to behave towards it? The new pen refuses to take up the ink—what is he to do? The position of his body is ill-chosen for writing—how is this to be remedied? His shadow falls on the paper—

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* I am not aware of a single piece of concrete analysis of a habit undertaken by any psychologist. [*Observe in action: your thumb, your fingers, your arm, your lips, your tongue and your eyes, keeping a copious record; also handle stick or umbrella, button your coat, take off hat, stretch yourself, pull out watch, etc.*]

The practical importance of proper habits has always been recognised. Aristotle, in his *Nichomachean Ethics*, bk. 2, insisted upon their value; and in recent years James (*Psychology*, 1890, i, pp. 120-7) has eloquently urged their claims upon students.

On the theoretical side, as regards habits, the speculative method has borne undisputed sway, painting the grotesque fancies of the *plain man* in luxurious tints. The common doctrine has been that repetition, exercise or practice, makes deeper and deeper furrows or "a smooth path" (Locke, *Human Understanding*, bk. 2, ch. 33, sec. 6) in the brain; and that in consequence there is "lapse of psychical initiation, . . . precision of response, . . . unfailingness of response, . . . difficulty of modifying it by special volitional effort" (Sully, *Human Mind*, 1892, ii, pp. 228-9). So Destutt de Tracy, *Idéologie*, 1801, p. 231: "Our frequently repeated movements [and thoughts, p. 238] become easy, rapid and little felt." So Maine de Biran (*De l'Habitude*, 1803, p. 169) quotes as effects facility, rapidity and indifference. To these marks of habit Reid (*Essays on the Active Powers of Man*, ed. 1863, Essay I, part 1, ch. 3) would add "inclination or impulse" to act; and with this judgment Stout (*Psychology*, 1896, i, p. 258) agrees. See also Foster, *Physiology*, part 3, 1897, pp. 1116-8.

The law of habit has been raised to great dignity. Dumont (*De l'Habitude*, 1875) holds that habit is a general property of matter, quoting (p. 348) Gassendi to similar effect. This opinion is shared by many; but see especially Hering, *Ueber das Gedächtniss*, 1870.

† To make the memory work instantaneously and unerringly in a complicated task is a matter which may require months and years of practice.

how shall it be prevented? The pen scratches or spurts, the penholder or pen is one he is not used to—how meet the difficulty? Such are some of the obstacles which detain the intelligent learner. These queries come to him at first as problems demanding a solution, and some of them may require severe thinking before they are disposed of. But as practice proceeds new cases tend to be extremely rare; for, once a difficulty is settled, the solution is soon well re-membered, and the problem ceases to exist. Thus special instances which resemble problems do not present themselves as such; they are now mere re-membered facts. Just as a normal constituent in a routine or organised process is re-developed, so we re-member these isolated instances, for they have become part of the normal order. Consider an example. The country road along which a certain individual passes is too rough for comfortable progress. He shuns the flints. If one of them is in one position, he steps beyond it; in another position, he takes a shorter step; in a third, he steps to the right; in a fourth, he steps to the left. By accident he may tread on an ugly piece of flint sideways, or on his heels, or on the arch or the ball of his foot, and in each instance he meets the difficulty in an intelligent manner. So with the minor undulations of the ground, or in walking up hill or down hill, or on board a vessel—an appropriate solution is forthcoming for each instance. At first it might seem that on every separate occasion he is compelled to decide on one of a dozen courses. As a matter of fact, each special difficulty has occurred previously, is re-membered and stands isolated. These cases cease to be cases of special difficulty. The solutions are firmly fixed in the memory. The obstacles, as they appear, are settled by reminiscence, and not by reasoning, speculation or inquiry. [*Observe yourself in dressing and undressing, and in walking.*]

(3) The precise effort needed in the formation of any letter or part of a letter is re-collected. Should more or less energy be required, the memory will gauge it. But for memory the hand instead of going slowly, might go quickly; instead of in one direction, it might move in another. The particular quantity and quality of muscular activity needed in an organised trend or habit is not generally a matter of calculation. Suppose a man discards an umbrella and procures a new one. After he has used the latter for some time it strikes him that the umbrella flies open rather too quickly. Then it occurs to him that the spring of the new one acts much more readily than the spring of the old, and that he had neglected to observe the difference. Unsuspectingly he was as active in opening this umbrella as in opening his late one. That is to say, we do not take each case on its merits; we go by precedent. In writing, re-collection stands in the same relation to the muscles as it does to sights or other sensations.

51.—The Process of Simplification.

(1) At first, as was hinted, there is a many-sided interest. We wonder

what is thought of our writing. We speculate whether we shall be praised or blamed. We doubt whether all is right. This interest is bound to depart in time, as is also the play of thought connected therewith. No needs remain that induce us to concern ourselves with our caligraphy. There is nothing left to wonder about—except, perhaps, our bad handwriting. The atmosphere of thought has changed.

(2) The time and energy spent in doubting, hesitating, brooding, trying to re-member, etc., are now set free. As the interest in writing declined, these agitations of the spirit decreased proportionately.

(3) At the commencement, especially when the child has little or no guidance, he is sure to make many mistakes. How is it that he forgets these?[*] It is evident that writing would be most cumbersome if he first re-membered the mistakes, and was bound afterwards to dismiss or correct them. If such were the fact, organised trends would be buried in confusion. Moreover, observation proves that his mistakes do not re-develop. The apparent anomaly is accounted for as follows. When a right solution and a wrong one develop, they do not equally persist. The wrong one has no interest attached to it and speedily disappears. The right one is sensibly retained and is deeply interesting. Other things being equal, of two compounds that which appreciably occupies the attention is the one more easily re-membered, and especially is this the case when a need for re membering is present. Hence the right solution will tend to be re-collected rather than the wrong one. Suppose the action in which the right solution persisted and the wrong one disappeared has to be performed for a second time. That will happen which favours the former. An effort will be made to re-develop that and not the wrong one. Other things being equal, memory will favour the re-collection of that which required a sensible effort. The wrong solution is thus less likely to recur. Again, the right solution having been acted upon, the action is connected with the right solution and not with the wrong one. Hence thinking of the action will, by preference, suggest the one and not the other. Further, the one solution having been acted upon, it has been for a longer period in existence, and memory will therefore favour the re collection of that one of two or more lines of action which has been previously acted upon. And again, the wrong solution is not only dismissed; it is recognised quickly, and therefore set aside the more quickly. There is no waiting till it has fully unfolded itself; it is thrust back before it has seen the clear light of day. Each time a solution is required, the right one is thus favoured, and the wrong one discouraged. Hence, on the average, the one not favoured is soon forgotten through not being re-called. Once more, other things being equal, that is re-called which excites interest. Therefore the right solution which excites interest will be reinstated while the wrong one, in which the interest is negative, will tend to be forgotten through not being re-called. And lastly, since the right solution is acted upon frequently

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[*] See also Stout, *Psychology*, 1896, i, p. 267.

and at short intervals, it, rather than the wrong solution, will be fixed in the memory.[*]

In the preceeding reflections we have probably an ample explanation of the fact that error lapses. In learning to write, such error tends to disappear, while the knowledge of what the process should be, prevents new mistakes from arising.

The following propositions convey the argument of this sub-section: (1) That on which attention is more exclusively centred is more easily remembered. (2) That which we do not, in the initial stage, make an appreciable effort to re-member, is forgotten. (3) That thought which is acted on is connected with the action, and is more easily re-formed than that which is not connected with it. (4) That which is re-formed as well as persists, is more easily re-membered. (5) If any part of what is erroneous is re-membered it tends to be immediately disintegrated or suppressed, thus hastening the oblivion of error. (6) That in which we are not interested, or in which the interest is negative, is not re-called. (7) Only that, other things being equal, on which attention has been centred frequently at short intervals, is re-developed.[†] [*Test step by step.*]

(4) Suppose the child is about to write the letter *i*. He admonishes himself "Dot your *i*'s." So with the letter *t*, he re-calls "Cross your *t*'s." Similarly he says, "I must hold the pen thus." In this way many of his actions are preceded by shorter or longer remarks. As he advances in his studies such preliminaries become obviously superfluous. The memory being perfected and the interest waning, these scaffoldings are removed in the manner indicated in the preceding sub-section. What happens with preliminaries happens with everything which is not essential to the process. One portion after another lapses until nothing but what is essential to the action (as he learnt it) survives.[‡]

This elimination of what is non-essential is facilitated by another factor. We can only elaborate simultaneously a limited quantity of systems. If we are considerably interested in one thing, we cannot spare much interest to other things at the same time. Thus there is a constant tendency for thoughts, as with animals in congested areas, to drive each other out of existence. We wish to write, and we want also to think of the subject-matter of the writing. Hence a tendency to make no more ado about a task than is absolutely necessary. The lessening of the interest itself partly disarms opposition. When we are, therefore, concerned about something, any disturbing or unessential phrase such as "Cross your *t's*," is suppressed as soon as it rises or tends to rise. With these occasions multiplying, and our interest in the writing departing—in the manner explained in the preceding portion of this section—everything unessential is forgotten. As the miller removes the husk, so, in the process of learning to write, our notions are gradually reduced and steadily divested of what is non-essential, until the pure flour alone remains. The occasions for this grinding down presents itself in practice through the need of, or desire for, development of other systems, and, hence, of our apprentice efforts, we retain only what cannot be rejected. The process of reduction needs no deliberate determination. We require no special knowledge of how to bring about the minimum of attention to our work.

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[*] The words interest, effort, attention, do not necessarily imply here more than the rudiments of these. As we shall see (ch. 4), re-development is always the outcome of effort teleologically determined, and hence known errors are not likely to be reproduced.

[†] This special analysis makes no pretence to being faultlessly accurate. Ultimately, no doubt, when the foundations of psychology have been laid, we shall obtain a mathematical version of the process of economisation. At present, attempts at mathematical statement, seeing the many problems involved, would be presumptuous and futile. We may as yet only tirelessly re-analyse and re-study our data.

[‡] Resolutions, and reflections generally, play the part of a scaffolding in the neural economy. They argue that a system is still in the course of erection. As adaptation grows complete, so the scaffolding is removed. Again, in another light, resolutions are themselves organised. Their meaning is neither verbal, nor a simple transparent something; but an established complex which is pointless unless we conceive it organically and varying indefinitely in richness of content and expression. (Ch. 4.)

Necessity grinds very small, smaller by far than we expect. We cannot be too clear as to the character of these important changes. Let us then see to what extent our notions shrink. We have seen interest fade, difficulties vanish, problems disappear, preliminaries dispensed with. Next, or along with them, the child forgets the formal aspect of the writing process. When his studies commenced, he learnt that he must hold the pen in a certain position if he wished to write with ease, that the arm should not be placed as the reinless fancy prompted, and the like. He knew, broadly speaking, why he did things and how he did them. This knowledge of the how and the why of the process was doomed from the beginning. Gradually losing his interest in writing, having no longer any need to refer to that knowledge, and being eager to elaborate other systems, he slowly forgets the how and the why. At first there was a bond of time and order; but now all ties are gone. He cannot tell relationship, time or succession. Each point is re-collected independently of every other point. He cannot even indicate the *what*, though he knows what to do. The *what* has departed as a notion, and exists as a remembered act. As the child progressed there was no need to re-develop the *what*, the *how*, the *why*, or any other system of relationships, and so these are forgotten. We detect here no substituted, transformed or added constituent, only certain once-existing factors have been removed. All that could be dispensed with has been cast aside.

Necessity has dissolved the connections which once prevailed, and hence the child cannot freely re-member the process of writing, or its relations, or its successive steps. When a portion is conspicuous, as the holding of the pen, he easily images the attitude. But when called upon to give a description from memory of the whole process—static and dynamic—he, like the mass of men, breaks down in the attempt. Even most of what is supposed to be re-membered proves imaginary.

We usually re-collect things well, because they are interconnected in our thought. So many other things resemble them, and they are related to so much else, that they remain in continuous touch with the general current of reflections. Most objects have points in common with other objects, so that even when we, to all appearance, do not think of them, we yet ponder over portions of them. As we move hither and thither in thought, we often come across stray notions—just as we meet friends otherwise than by appointment—and when we do not meet these, we yet encounter thoughts that involve fractions of them. Thus ordinary notions have a fair opportunity of being re-collected. In the case of the atoms we are dealing with, there is a difference. They lack universality and all relationship except the one that connects them with their stimuli. These "writing atoms," on account of their peculiar unfitness, never enter the normal stream of thought, and hence nothing is able to develop them. They lack intelligibility. They live entirely to themselves. [*Acquire some complex habit and test the process of simplification.*]

52.—REDUCTION OF EFFORT.

While advancing, the child discovers on frequent occasions that a less effort will accomplish his object as completely as a greater effort. The strain is accordingly reduced, and energy is thus prevented from running to waste. [*You should test your habits in this respect.*]

53.—APPROPRIATE EXERCISE.

It is known that, within limits, appropriate physical exercise hardens and increases the size of the muscles, and that, as a consequence, we are able to carry out more with the same or a lesser effort. We are also aware that *only* continued effort, and *not* effortless exercise, leaves marked traces. As with strength, so with skill. Apart from what a perfected memory accomplishes, there is an additional aid given by neural development of some kind. We become, through appropriate exercise, more skilful than we should be otherwise. Nerve messages are conveyed with greater rapidity and certainty. [*Are they?*] For this reason, over and above what remembrance, oblivion and reduced effort do to simplify an activity, other circumscribed neural changes lessen the necessary output of energy still more.* [*Test by exercise.*]

54.—A COMPARISON.

Let us once more compare the process of writing in the days of the child's early apprenticeship with the state of affairs when he has naturally done learning. To begin with there was ceaseless bustle, now there is none. Through considerations now well known to the student, the amount of attention needed has been greatly reduced. The different parts of normal habits are re-membered without strain; the child knows how to meet difficulties which are likely to occur; he is no longer interested in the process itself; known error is absent; there are no problems, or almost none; what is unessential has been forgotten; less energy is expended; and, lastly, the development of nerve and muscle has further reduced the demand upon the attention. That is to say, effort has been toned down in four ways: (1) The child re-members with ease; (2) he has forgotten what is unnecessary; (3) he has regulated the output according to the actual demand; and (4) his developed nerves and muscles work more efficiently with less effort. [*Try and add to this list.*]

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* Only exercise and its effects are commonly thought of by psychologists when discussing the nature of habit. Yet even here the quality rather than the quantity of the exercise is the essential factor.

There is, therefore, nothing mysterious in the seeming absence of complexity in routine or habit. The energy required being largely reduced, the process is simplified in proportion.

55.—The Result of Liberating Attention Energy.

Along with the changes which have been described has gone a silent transformation which I now proceed to state. We know that there is present at any time an equal amount of attention. If we require more of it in one direction, we have less at our disposal in any other direction, and *vice versa*. Hence, as the process of writing is being simplified, the attention which is set free will be employed in other ways, and as the habit reaches its maximum simplicity, the greater part of the attention must be redistributed.

After slight practice we can spare just enough attention to look around us. Later on we may possess sufficient to hum a tune, and later still, to pursue long trains of thought. As, at the commencement, there was no attention available except for writing, so at the finish our writing makes no appreciable difference to the general current of thought. We have observed how in the struggle for life and comfort thoughts drive each other off the field. The same procedure is encountered here in a modified form. At first, when a little energy is set free—when a kind of attention vacuum is created, and our eyes wander—there is embarrassment and the balance is disturbed. We are confused in our work and confused in our thought. As more and more energy is set free the effort to divide the attention is repeated, and, by perseverance, the endeavour becomes more and more successful. Finally, we closely attend to our writing while also attending to other matters. Just as weights tend to fall, so attention ever strives to be fully employed. A simple experiment will provide a further illustration of what we are attempting to elucidate. A man takes two pebbles. He holds them in one hand. He throws them up into the air successively. He tries to catch them in the same hand as they successively return, and to throw them up again. At the start of the experiment he is confused. He has too much to attend to. In trying to follow the eccentricities of one pebble, he follows neither and catches neither. It seems impossible to him to attend simultaneously to both. While he is thinking of one, he neglects the other. His adjustments for intercepting them fail. Instead of closing his hand for an instant when the pebble touches it, he watches the other pebble, and instead of watching the other pebble, he closes his hand. But as he continues to experiment the attention is thoroughly divided, and he acquires the coveted skill. After additional trials he might be successful with three pebbles, or attend to the two pebbles and be thinking of other matters. [*You might repeat this experiment.*]

Thus it happens that while we are engaged in writing we are usually engaged in other directions also. When we are copying we may be listening to a conversation, if, perchance, our superfluous attention is not busy with something more serious. Gradually we have accommodated ourselves to write while following other lines of thought. On the one hand, interest urges us to disengage part of the attention; on the other, the presence of liberated energy seeks an outlet.*

56.—DOES AN ORGANISED TREND EVER BECOME AUTOMATIC?

(1) Both the process of simplification and the acquired power of pursuing several thoughts independently may have suggested that writing comes to be in time a mechanical act where attention is superfluous. On the other hand, we have seen that there is no fundamental change, only a simplification. A further proof of this, if needed, is easily forthcoming. We know, roughly speaking, that the distribution of systems is at all times equal, assuming the normal waking state. If, consequently, we are absorbed in thought, we should expect that writing would proceed with difficulty and finally cease, and this actually takes place. We cannot be completely absorbed in anything while writing, for divided attention is only possible when the attention is divided.

(2) A purely mechanical act would be one in which no sensations were present. This is not so with any habit, however confirmed. In learning, we encountered sensations to begin with. These sensations grew gradually fainter (sec. 51). Some of them are now so dim that they are hardly perceptible. Yet their unobtrusiveness only indicates a reduction in the energy employed; in other words, it records that less energy is wasted. These sensations represent physical activity, and only when that ceases do these sensations disappear. They are the index of work done. It will be found true, I believe, that sensations are never missed from an activity which at any time was followed by them. It is also probable that wherever the influence of the unimpaired cerebro-spinal system reaches, there we have sensations accompanying physiological activity. Perhaps they are not essential, as is shown in the case of tickling the foot of a man whose spinal cord is injured above the point whence the nerves of the lower extremities emerge; for this man withdraws his foot, though he feels nothing. But where the activity is central, or connected by nerves with the higher nervous

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* Hence Stout's explanation, already quoted, that "each mode of mental process tends to arrest and suppress others" (*Psychology*, 1896, i, p. 196) as well as Lipps' similar reasoning (*Grundtatsachen*, 1883, p. 164) fail to convince.

centres, there we shall find sensations alongside of physical activities. However, these are matters for physiological research.

The nature of sensationless human activity would well repay careful study. Here we can only touch upon the subject. From ch. 2 we know that reactions are systematic, and that any severe drain upon the attention in one direction entails a breaking-up of systems in other directions. Thus we may readily listen to this conversation or to that; but once we are interested in one, the other ceases to exist for us. For this reason the vast mass of possible systems are never formed. Now the tendency of economisation naturally favours minimal development of what is unimportant, and this may be illustrated by the case of reading. With the attention fully employed with it, not only is everything noted and easily re-membered; but the printed thoughts are read in connection with one another, and with due regard to relevant memories. Lessen the attention and things are little connected; each sentence is understood only by itself; and is no sooner understood than it is forgotten. Further reduce the attention and the words become bare sounds which are perhaps not even heard. Once we recognise that every sensation represents a system, we can see how we may speak without hearing our speech, and how, generally, habitual motor action may persist when we are otherwise very fully absorbed, although sensory systems are not developing. Given, however, normal attention, and the sensations re-appear.

It is a commonplace that special attention to any portion of the body, develops, as we shall see, unexpected sensations and also ordinary ones in greater fulness. When then we contemplate the opposite process of being specially inattentive to the body, we learn that cutaneous sensations and pains are often wholly absent. *The extremities and the body move: effort and discrimination are present; and yet nothing is felt.* This is in full accordance with theory as well as with experiment, and can only surprise us if we have paid too little heed to the nature of economisation.

A further step is yet possible. The man who has hearing, not only hears a loud report, but shrinks and is disconcerted. So also a child who has accidentally touched a hot dinner plate, not only feels the heat but screams. Thus not only is a putrid smell or a nauseous taste recognised by him who senses smells and tastes, but disgust and loathing follow. Things are different with the sense-less man. The loud report, the hot plate, the putrid smell and the nauseous taste, do not exist for him, nor does he shrink, scream, or show disgust and loathing when what is objectionable to the normal man is present. And such is the normal man's attitude when the attention is deflected: *he neither hears nor shrinks.* Hence we may conclude that sensory inactivity, whether temporary or permanent, implies the strangling of a process at its very inception. When these facts are allowed for, we can understand how, under certain circumstances, a temporary inactivity may become permanent. Suppose a lad wishes to walk in a soldierly way. Holding himself upright, the act being a new one, is accompanied by clearly appreciable organic feelings. As he practises, physiological adjustment becomes closer. Finally, internal bodily changes create a new situation where the holding oneself upright ceases to be accompanied by peculiar sensations. Certain systems, therefore, tend to cease entirely or tend to be replaced by others.

Economisation has then several effects as regards sensations. It may temporarily suspend them; it may reduce them; it may abolish them; or it may change them. Circumstances will decide which line of development is to prevail.

A point of view such as is outlined above, goes some way towards explaining such a phrase as acting with or without consciousness. When, for example, owing to a severe cold, the sense of smell forsakes us, we say that we are "unconscious" as regards smell: the perfume of the wall-flowers close by leaves us unaffected. Here "to be unconscious" means that no smell system has developed. However, since we shall see in ch. 8 that all knowledge is embodied in primary or secondary systems, the total cessation of these systems will not leave us the world of objects minus "consciousness," but blank nothingness. (See also sec. 19.)

(3) It might seem a plausible surmise that every step in a routine process or habit is developed by the step which precedes it, and that on the first step being developed the others follow automatically. The whole process, unless interrupted, would according to this hypothesis, run down like an alarm-clock; or it would be as with a row of bricks appropriately arranged: as the top portion of the first brick received a push in the direction of the other bricks, it would fall on the second brick, which would fall on the third, and so on until the last brick fell. Facts, however, do not bear out this theory. It is not the outward stimulus that develops the reaction; for as the stimulus makes itself felt so, at the same time, the reaction begins to develop. The stimulus touches a brain area where both stimulus and reaction are implicated. It is not a case of one neural affection following another; there is but one neural affection as a result of which we both observe and act. And, likewise, along with the reaction there is already developing a tendency to prepare for a further stimulus. The disturbance, to state the thesis differently, is never strictly a local one. Hence we must reject the suggestion that routine process is a mechanical step-to-step process.[*]

(4) We are bound to go further. With any complex process such as writing, we cannot stop at inconsiderable neural changes. We have to reckon with a need which persists throughout. When this is interfered with, we cease to write. Such stimulating needs, the needs of our nature, are the source of organised trends of every description, as indeed of every task. They represent a definite neural sensibility which enables the work to proceed. The cessation of the needs involves the cessation of the sensibility referred to. It is this sensibility which conditions the ready reception of the stimuli and the ready reaction following. In the literal sense, therefore, we have nothing atomic or purely mechanical in a routine act like that of writing. We are still dealing with a living complex.

57.—ORGANISED TRENDS AND MEMORY.

The child is resolved to write the letter *r* more distinctly. Next time he sits down to write he does not re-member his resolution. In some instances he knows that he is coming to an *r*, and yet again and again writes in the bad old fashion. The explanation of this, after what has been said in the section preceding the last, is not difficult. The child pursues his task independently of other labour. He has drilled himself into not permitting different activities to interfere with each other. Hence the writing tends to proceed along its own lines. A certain stimulus is constantly connected with a certain reaction, and when the stimulus is present, the reaction follows. Just as at first the slightest attention to other matters disturbed the writing, so now on the contrary, it is extremely hard to disorganise this activity. We are so used, while writing, to ignore the general stream of thought, *i.e.*, not to allow the least interference with routine, that even thinking at the proper time of the desired change is sometimes not adequate.

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[*] Robertson (*Psychology*, 1896, p. 232) expresses the prevalent view when he says: "Habits are . . . automatic to the extent to which they are fixed and go on by themselves." See also Murray, *Psychology*, 1885, pp. 100-4.

Usually we check ourselves, when we think checking desirable, but frequently our resolutions are not re-developed at the right moment. There is an additional cause for this, besides the one we have mentioned. The notion of the correction is not so firmly fixed, nor so ready to pass into action, as the fault we wish to remove. A slight stimulus would, therefore, develop the latter and not the former. Such is the normal reason why the correction is often re-membered after the blunder has been made, and why we as frequently fail to re-collect our resolutions.

"At first, and before the habit is acquired, every act is slow, and we are conscious of the effort of deliberation, choice, and volition; by degrees the mind proceeds with less vacillation and uncertainty; at length the acts become secure and precise: in proportion as this takes place, the velocity of the procedure is increased, and as this acceleration rises, the individual acts drop one by one from consciousness, as we lose the leaves in retiring further and further from the tree; and, at last, we are only aware of the general state which results from these unconscious operations, as we can at last only perceive the greenness which results from the unperceived leaves" (Hamilton, *Metaphysics*, 1877, i, p. 370). There is, of course, no room for Hamilton's picturesque explanation which implies the absence of simplification. "Actions we call rational are, by long-continued repetition, rendered automatic or instinctive" (Spencer, *Psychology*, 1890, i, p. 456); and "the requisite impressions being made on us, the appropriate movements follow: without memory, reason, or volition, coming into play" (p. 458). So far Mr. Herbert Spencer. Stewart (*Elements*, 1808, p. 109) has another fascinating theory. "The wonderful effect of practice in the formation of habits, has been often, and justly, taken notice of, as one of the most curious circumstances in the human constitution. A mechanical operation, for example, which we at first performed with the utmost difficulty, comes, in time, to be so familiar to us, that we are able to perform it without the smallest danger of mistake; even while the attention appears to be completely engaged with other subjects. The truth seems to be, that in consequence of the association of ideas, the different steps of the process present themselves successively to the thoughts, without any recollection on our part, and with a degree of rapidity proportioned to the length of our experience; so as to save us entirely the trouble of hesitation and reflexion, by giving us every moment a precise and steady notion of the effect to be produced." And so Stout, *Psychology*, 1896, i, pp. 199-200: "When we turn to the nervous system itself, we find the tendency towards a stationary condition evidenced by the facts of habit. All automatic actions are the fixed and uniform response to the fixed and uniform recurrence of similar modes of stimulation. Now, we have already seen that automatic action, as such, is action which does not involve attention."

58.—THE PLACE OF EXERCISE.*

We will now determine the place of exercise, as apart from other influences, in the organisation of the process of writing.

(1) I have for many years been writing, I shall persumably write for some years longer, say twenty years. I shall, therefore, have an additional twenty years of exercise. Will my handwriting then be better, and shall I

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*For accounts of the place of exercise, see Berger, *Ueber den Einfluss der Uebung auf geistige Vorgänge*, 1888; Cornelius, *Das Gesetz der Uebung*, 1896; Du Bois-Reymond, *L'Exercise*, 1882; and Hoffding, *Die Bedeutung der Wiederholung*, 1883.

then be writing more rapidly, supposing mine be a normal case? Hardly. The probabilities are that twenty years of added exercise will make no difference worth speaking of, nor would fifty years even, apart from the influence of old age or the intervention of death. Exercise has no absolute value. A statement to the effect that "improvement in the quality and the speed of writing is in direct proportion to exercise" would be incorrect, as is also the milder form that "exercise strengthens faculty."

Practice does not always lead to proportionate growth and perfection of faculty, for it sometimes ends in writer's cramp and similar deplorable developments. This is the opposite of what we encounter on observing that so-called "gentle" exercise counts probably for nothing. So also chronic pains may grow worse with time; they may become better; or their influence may be considerably diminished. The doctrine of habit, as commonly formulated, is made up of popular generalisations of the loosest possible texture.

(2) In the elimination of what is erroneous and non-essential time rather than exercise is a favouring factor. While the former offers opportunities for the detection of improvements and mistakes, hastening in this way the evolution of organised trends, the latter remains neutral as regards these changes.

(3) Memory is slightly strengthened, and development, to an inconsiderable extent, assisted by means of effortless exercise.

(4) Only effort, persistent in its nature, brings about sensible improvement in primary or in secondary activity. When effort is not strenuous, or is too strenuous, advance in ability is practically out of the question. Nor is constant progress, speaking generally, possible. A river incessantly wears away its banks, and wind and rain never leave off denuding a mountain. Not so with organised reaction. Exercise does not incessantly produce changes in direct proportion to the amount of effort expended.* [*Test* (1) *to* (4).]

59.—The Place of Judgment.

I have described the evolution of a habit. I have sketched the origins of that evolution; but I have not, I hope, suggested that the method is such that all men end in writing alike. The hands of a watch report progress automatically; but the development of an organised trend

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*Compare with the above view of the place of exercise that of Stout, *Psychology*, 1896, ii, p. 4: "In learning to read . . . association has been so strengthened by repetition that it has become capable of fulfilling by itself the function of attention"; and that of James, *Psychology*, 1890, i: "That [habit] is at bottom a physical principle is admitted by all good recent writers on the subject" (p. 105). "Dr. Carpenter's phrase that our nervous system grows to the modes in which it has been exercised expresses the philosophy of habit in a nutshell" (p. 112). Habit "simplifies the movements required to achieve a given result, makes them more accurate and diminishes fatigue;" it also "diminishes . . . . attention" (p. 112-4). It is plain that James echoes a tradition, without inquiring into its credentials.

One aspect of the results of exercise may be summed up as follows: "Every one knows that in those places where the skin is frequently exposed to pressure, to friction, to hot objects, or to corrosive liquids, there follows an abnormal development of the epidermis" (Du Bois-Reymond, *L'Exercise*, 1882, p. 100).

is not of such a nature. The use of judgment, of which I will now speak, is a factor which cannot be too highly appreciated.

Suppose a man learns to write without a teacher. He will undoubtedly make numerous blunders, while he will only learn with great difficulty and very slowly. When the routine stage has at last been reached, he will find that, in comparison with those well taught, he writes badly, makes many serious errors, and spends more energy on the writing than is necessary. He will also discover that a variety of problems are met by him unintelligently, and that many movements are not so simple as they might be. Organised reaction, as such, in no wise implies perfection. While one writes a splendid hand, another may have a wretched scrawl. From the point of view of perfection it would be suicidal to consider time, exercise and effort, as the only essentials in intelligent development. There are hosts of aged workers who are stupid, clumsy, slow, in spite of a life spent in a special class of work, while there are others more favourably situated, who do the same work better and with greater speed, although they have had but a year or two of practice. Efficiency would be almost universally absent if we acted upon the belief that with the lapse of time bad workmanship disappears and good workmanship develops.

Let us assume that a young man whose education has been neglected, is anxious to write well. He procures a tried teacher. Of beginners' blunders many are common, and others are infrequent. His teacher, through foreknowledge, prevents the majority of them from occurring, and speedily reforms the others. Few mistakes are permitted, and none are allowed to strike so deep that they are difficult to uproot. The pupil stands no risk of injuring spine, lungs or eyes. He has not repeatedly to discover that he is on a squirrel track.

Thus far the teacher's help is negative. On the positive side he communicates the shortest, the simplest and the most effective manner of writing. He ensures that there is little to learn and less to unlearn. He reduces labour and perplexity. He knows just what should be done, and insists upon that alone. The consequence is that his pupil acquires the art of writing perhaps with one-third the trouble and in one-third the time expended by another who, though otherwise his equal, has had no teacher or a bad one.

Exercise offers no guarantee that we shall perform a movement in the best way.* In many an organised trend in which the parts are not obvious (and in most they are not), movements are executed circuitously. A lifetime of exercise may make no difference in this respect, for the most direct way is not revealed mechanically and is very often difficult to discern. A careful analysis will thus frequently show that movements are superfluous and that sometimes the prevailing method is cumbersome and wastes time, trouble and effort. Hence sound training alone, not mere superficial training, can produce the effect we should aim at. As with circuitous activities, so with the absolute amount of energy expended. Most men employ in organised reaction more energy than is needful; the initially superfluous output becomes the normal output; and thus part of a man's energy is frittered away. Thoughtful analysis alone indicates the proper quantity of energy demanded. Time should never be wasted. We need never cease learning or improving. *Alertness, deliberate observation and the study of others engaged in the same or a similar pursuit, all tend towards progress.* [*Note these three rules.*]

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* One stormy day I watched the manner in which various persons carried their umbrellas. Almost without exception the umbrellas were held with the stick at right angles to the ground. Yet the wind was all the time beating strongly from one side! Thus people do not adapt themselves in rainy weather to the precise circumstances, though they have for years been accustomed to umbrellas. So also a person may have reached old age without having learned to adjust his tie properly.

Not exercise but judgment is the more desirable. Judgment is also more important than time. Double the former and you quarter the latter. In many an instance half an hour's conversation with the right individual will do more than years of plodding. A wise man will, therefore, learn nothing at haphazard, and will introduce judgment into every activity. The child who learns to write, benefits in every way by the employment of his own and others' judgment. He ought to be taught that *exercise alone will not bring him to his goal.*

Trends are sometimes established in anything but a deliberate manner. In sitting down, for instance, I chance to lean back in a particular manner, and so feel more comfortable. However, I have but the dimmest notion of the consequences, and I should be surprised if any one were to tell me that I felt more comfortable. A little time afterwards I lazily repeat the act. Grain after grain of intelligence is thus sown until after a while, a full-blown trend develops. Even then I may hardly be aware that such a trend exists. When little attention is used, a thing is thought of only in its immediate relations, and in this way much is acquired with slight notice. Similarly, pressure of time, accident, greed, and what not, gradually initiate changes in our activity in a half-perceptible way. It is a crude conception which imagines that our trends-to-be are first conceived in the flaming colours of elaborate resolutions.

60.—WHY IS IT DIFFICULT TO INFLUENCE HABITS?

The learner has ceased to be a learner. The organised trend is fully formed. The apprentice has reached a stage at which he writes without troubling himself about the how of writing. Suppose he arrives at the conclusion that he soon feels tired when writing, while others do not. Suppose he decides to make the necessary changes which shall enable him to write without rapid exhaustion. The ideal procedure in such a case would be, first, to re-member, and then to remove the constant antecedent of the worrying sensation. As we have learnt in sec. 51, this homely method is not open to him. There is nothing in the memory that will suggest the antecedent; all temporal or logical bonds are forgotten; he does not know what is followed by what; he cannot re-member what he learnt or how he learnt. Hence he is bound to investigate. Oblivion makes it difficult to introduce changes in routine.

He proceeds, then, to inquire. Perhaps one movement needs changing, perhaps two, perhaps three, perhaps twenty. Possibly the immediate source of discomfort is the result of the foolish position of some one part of the body. What is it, and which is it? He will not find it easy to decide. Perhaps one seemingly well-calculated change is introduced, and nothing satisfactory follows. Perhaps some unexpected effect results. Perhaps the change makes matters worse, and he writes more awkwardly than before. He tries a fresh position or movement and still another, but without success. Perhaps he remedies the evil, and introduces a greater in its place. No horoscope can be cast as to what will or what will not happen. He is dealing with what he cannot understand until he has observed its effects. [*Deliberately drop some habit and observe.*]

As a further illustration, let us take an example with larger outlines. Strolling about in a poorer portion of London we may notice that the heels of those we are watching are worn painfully low on one side. Suppose one of these people wished to remedy the defect. Merely to make a resolution that he would walk properly would be useless. If he tried to think of his walk he would most likely find nothing that suggested a solution. The same would probably happen if he proceeded to observe himself or others. Being baffled, he decides on experiment. He walks somewhat differently from his usual style, but there is no apparent result. He alters his walk again: it seems to him that the change is an improvement. He advances a further step: matters are worse than they were to commence with. He may thus go on experimenting for years and not achieve his purpose, or he may spoil his walk in other ways. It is not that he is wholly unaware of what baffles him, but he cannot effectively recall its normal antecedents. In moving a step there are a multitude of motions with their accompanying sensations. These sensations are noted. If he is attentive enough he learns their presence; but he cannot fix them steadily or re-develop them at will, except after special practice. Even then, as one motion determines the succeeding ones, only the development of a series would be of assistance. Such a feat would be too much for a trained psychologist; it is still more so for an average man not practised in introspective analysis. Hence men, as a rule, do not experiment much. They discover how troublesome it is, and almost invariably decline the invitation.

Ordinarily, then, when it occurs to any one that he might improve his method of writing, he lightly passes over the suggestion. Perhaps he pictures to himself the labour it will occasion before he achieves his purpose. Perhaps, and this is more likely, he dismisses the thought because he has dismissed similar thoughts before.

Suppose, again, that a man does know what tires his hand in writing, or what attitude is the most desirable. He has not therefore surmounted all difficulties. He must forget the old way, and learn the new. Now we have seen how independent a habit normally is of other habits or of the general current of thought. Hence he has no mean task before him. Each time he wishes to write, and all the time he is writing, he must be thinking of the alteration he intends making. If he neglects to do this, he fails to work himself out of the old rut. Speaking generally, so firmly established are the existing arrangements that often months or years pass before they are forgotten and the new method is assimilated.

Other difficulties arise. He may be preoccupied and forget the experiment on which he had embarked. When a favourable occasion again offers, the experiment is not thought of and he unknowingly treads the old windings. Perhaps months afterwards he re-collects that he has had a notion of introducing some alteration. He repeatedly forgets his aim for hours, days or weeks, as the case may be. Hence the hope of success recedes, and this induces a lowering of interest, despair of final victory, and disgust. But grant that he perseveres and succeeds. The gain is not patent. If each fault he wished to grapple with took a long time to overcome and entailed much trouble, he could at best correct very few slips during a lifetime. Besides, he could not think of altering several faults at a time. And one more difficulty. Suppose a man makes up his mind to go to bed at 11 P.M. He carries out his resolution. In due time, as explained, the resolution is forgotten. Then some opportunity presents itself to stay up later, and slowly and unnoticed the time of retiring is changed again. Such reversion to old habits is frequent, and must be reckoned with.

Though sweeping changes in adults are almost out of the question, and though innumerable organised trends can only be transformed at the cost of much time and trouble, there are yet exceptions to this rule. Many an action which we have persisted in for years, as we shall see, may have its character altered at once, while various activities may give rise to little trouble in the changing.[*] In some instances an intelligent method rapidly produces far-reaching effects, and the introduction of a particular trend may scatter a multitude of objectionable activities.

Changes in habits are, as a rule, hard to accomplish. The lesson to be derived is elementary, indeed. We must at the outset ensure that we do a thing well. We must prevent the ripening of objectionable activities, and we must foster the development of such habits as mature reflection would approve. In practice, taking life as a whole, the alternative to obviating the growth of bad habits is to bear with them stoically when they are formed. Attempts at general reform have failed and must fail.

61.—Early Education.

To avoid the necessity of having to recast a multiplicity of activities, we must begin rational education with the infant; for by the time the child is of school age, the general outlines of his nature are fairly settled, and it is then, for many reasons, hard to change his character or to remove serious defects. Only the most thoughtful and the most thorough-going attempts will successfully counteract the neglect of the previous six or seven years. The reasons for laying special stress on the first three or four years of life are as follows: (1) A child is physically, intellectually and economically dependent, and we possess, therefore, undisputed freedom to place him under conditions favourable to the development of desirable activities. (2) A child's memory is weak. Even when he is compelled to do a thing, he soon comes to do it spontaneously, having forgotten the grievance of compulsion. (3) A child forgives as easily as he forgets. He nurses no resentment. (4) The child is not sufficiently ingenious to plot against its educators. (5) For the same reason he can seldom understand or foretell the educator's intention. (6) A child has no deep-seated objectionable activities. (7) A child easily acquires desirable activities, and as easily shakes off objectionable ones and *vice versa.* (8) When an activity has been formed early in life it displays the maximum capacity of developing into strength and efficiency, and such activity is very difficult to unsettle in later life. The opportunities for early training being so numerous, the earliest period should be made the most fruitful for educational purposes. It does not follow from the above that a human being's plasticity draws to a close at the age of six or seven. The plasticity passes slowly, and can hardly be said to cease when we reach maturity. The skill, which is acquired with slight effort at fifteen, is unattainable by the man of thirty-five,—compare for instance the respective capacities of these two ages for shorthand. Again, what the child of six can learn with little trouble, the boy of fifteen may be debarred from acquiring,—efficiency in violin playing is of such a nature. In the evolution of routine the stage of general development must be allowed for. As we grow older, deeper changes or fundamental acquisitions become less and less possible. Not by any means an insignificant factor in this staidness of age is the type of individuality which the mature man develops and the conditions under which he lives. Where the circumstances and the type are similar to that of the young child, there we expect and find similar results.*

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[*] "Let any one try for the first time to write or draw while looking at the image of his hand and paper in the mirror, and he will be utterly bewildered. But a very short training will teach him to undo in this respect the associations of his previous lifetime" (James, *Psychology*, 1890, ii, p. 182).

62.—EACH HABIT IS BASED ON OTHERS OF ITS KIND.

In analysing the development of the child's power of writing we assumed that we were starting with a non-organised process and ending in an organised one. At the commencement, we were face to face with complexity; at the end, with simplicity. There seemed to be a definite initial stage and a definite winding up. These various assumptions are far from being defensible. Strictly speaking, as we shall see at once, there was no beginning.

(1) In writing we make certain movements which, as we have previously noted (sec. 50), are guided by re-collection. If we neglect the general muscular memories, there remain only random movements; but we do

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* As to the importance of acquiring good habits early in life, see Carpenter's *Mental Physiology*, 1876.

not start with such in learning to write. We are consequently making use of existing systems in the formation of a new one. Organised trends, in other words, are only new to a certain extent.

Let us realise this more completely. A person is not used to lifting weights. One moment he exerts more energy than is needed, the next less. He sees a weight, but being ignorant of the precise effort required for lifting it, he mistakes the probable result of his efforts. Yet, after amassing knowledge he almost always puts forth the proper strength. A glance he develops the appropriate effort, and the merest attempt at lifting suggests the weight. Picking up a piece of aluminium, the specific gravity of which we are not acquainted with, we find we have exerted ourselves too much. Moving a *papier mache* table we note, owing to our mistaken notion of its weight, a peculiar feeling due to its unexpected lightness. The weight of an object we measure off by memory (sec. 50). The output of energy is graduated according to past outputs. Very early in life the child learns to know the resistance implied in tactile systems, *i.e.*, how much labour it requires to move them or to raise them. When the child then begins learning to write, the majority of muscular efforts which will be required are already part of many organised trends. This knowledge he incorporates solidly into the action of writing. He has not to experiment anew, for experiments have been long done with. If the knowledge of every movement had to be freshly acquired, the process of learning to write would assume monstrous proportions. Still, as in the instance when we lift a piece of aluminium for the first time, we have in learning to write a few special reactions. These are the new constituents in the trend; though they themselves are based on previous acquirements.

(2) As with effort, so with ingenuity. Previous to learning to write, the child had years of training in skilfulness. The intelligence required in that branch of knowledge is only specialised intelligence—the old skill, plus a fragment of new skill. Various tasks which demand little art and resemble previous exploits, are performed accordingly by a simple reference to memory, while other activities, necessitating much specialised ability, are only partially assisted by older acquirements. In any case, a set of general principles which results from growing knowledge helps in the solution of each difficulty. Thus, for one person, a problem will be hard to unravel, while for another the solution is given immediately by memory.

(3) A like criticism applies to the part played by suppression. The child, urged by needs, has from a tender age suppressed uninteresting thoughts and dwelt upon interesting ones, and this power of shaping a habit is, therefore, not a new power, being itself organised and capable of improvement. If it be well developed, thoughts are more easily dwelt upon or dismissed. It is constantly being affected by what happens. Hence it has nothing new to perform when we are learning to write. It is an established activity, more or less polished by use, memory and judgment. In a somewhat fresh application, the old mechanism is microscopically improved in a certain direction.

The argument may perhaps be forcibly brought home by considering the following instance. One man is in splendid condition as regards strength, skill and judgment. Another man is not in good condition at all. Both are set to learn a business in which the three qualities mentioned are required. The former will learn it with ease, the latter with difficulty. The former already possesses much of what is required in the business, the latter does not. The former recognises much that is not new to him, the latter very little. Countless difficulties have been overcome by the former in other connections, and thus many perplexities do not exist for him.

It is only in an arbitrary sense that the developed mode of writing can be said to have had a beginning. The mass of what is organised was so before the child learnt writing, and remains organised alongside of the special capacity we are considering. We cannot, therefore, consistently speak of beginning to learn to write, or, rather, when we so express ourselves, we must understand clearly that we are utilising the components of other organic trends, and that we are contemplating a compound of new and old tasks. In the new activity we have a specialisation of old activities.

An average adult so readily forms primary and secondary combinations and is so swift to adapt himself to an immense variety of circumstances that nothing but miracle seems to explain his activity. A saner view, however, results when we pry into the history of these combinations. We find then that steady growth in adaptation accounts for the fertility of resource. The infant learns with irritating slowness to use his senses, and in the course of instinctively determined movements he gradually acquires the physical skill which the adult so readily applies. Only by protracted stages do the senses come to act together, and only in this manner does the child come to use his hands for the purpose of grasping. As with primary combinations, so with secondary ones. Under the pressure of needs more and more complications of a primary and a secondary character develop until we have the magic rapidity of adult life. Here the muscular and the neural systems have reached their greatest efficiency. Since we, then, can observe the factor of growth, we have no option but to regard the secondary, like the primary, world as a highly organised system of combinations. In other words, the thoughts and actions of adult existence are intelligent and varied because they are the product of a long process of natural selection. Habitual process, therefore, if it is regarded as organised process, is a fact that embraces all primary and secondary combinations without exception. For the same reason, spiritistic theories, placing as they do an unanalysed man behind the man, must be unprofitable to the student who wishes to understand the facts of adult life. The study of evolution alone yields an intelligent account of the human machine.

63.—Each Habit forms a basis for Others of its Kind.

In learning to write we start with organised reactions. Naturally, when we have learnt to write, this new trend (the strength, skill and knowledge acquired) forms a partial basis for other trends. Thus a sign painter or lithographer profits from knowing how to write; the position we place ourselves into when writing may be advantageous for many purposes; the way we hold the pen may assist us in drawing; and writing itself might possibly be considered a department of drawing. We conclude, then, that the mechanism of writing is not self-contained, since it presupposes organised reaction and serves as a basis, or forms a department, of other such processes.

64.—WHAT IS A HABIT?

We have analysed at full length a particular example. In the last two sections we saw that an organised trend is not self-contained (if we allow that writing is a fair type of it). How then is a habit to be described? What are its distinguishing marks? Is it a bundle of such habits? Or is there no such thing? Or is the notion of a trend a mere generalisation of convenience?

A man wishes to know the time, and he pulls out his watch and looks. The hand points to two o'clock, while the hour must be about eight. Then he recollects that his watch has stopped for some days. The compass of this trend is very limited, and its development must have been correspondingly simple. As there is but one complicated movement, and that one common to other movements, he has had next to nothing to learn. Even the fact that he takes hold of the watch by the ring, is matched by similar reactions. What is new is that he accustoms himself, in the manner explained in sec. 55, to look at his watch without allowing the action to interfere with the general current of thought. Even this is overstating the case. The element alluded to can hardly be called a new one. The whole process is primitive. We are constantly engaged in doing with but the slightest interference what might be called fresh things, so that all we have new in this action is the somewhat greater ease with which the attention is divided. The obviousness of feeling accompanying the suggestion of the act is reduced to an inconsiderable extent.

We may speak of climbing over a stile as an acquired habit, yet that action embraces perhaps not one new feature. A man climbs over a stile as he has been accustomed to surmount similar obstacles. Thus fifty different activities might be considered as fifty distinct sets of organised reactions when there is in reality but one. In the instance of the stile we are considering, not at all a simple one, there is, roughly speaking, no learning, no mistake, no oblivion, no effort of attention. A person scales the hundredth stile with perhaps no greater ease than the first.

Consider a man's general bearing. May he speak of it as organised? Perhaps he has seen some one bow in a certain fashion. He admired the elegance of the gesture, and when he had to bow, he re-called his model. Or as he grew up he bowed as his sister or brother did, without deliberation. Or he adopted the various portions of the bow from various persons, not connecting in thought the different movements he has imitated.

Thus with the smile present on his lips; the manner he holds his head; the way his eyes meet others' eyes; the normal expression on his face. In short, he may speak of his total bearing as a definite settled whole; as acquired deliberately and in a logical order of which he is precisely aware. As a matter of fact, a mass of independent units are probably included in our bearing. A small portion of it, such as the way in which we bow, may have been, as shown, acquired at different times and independently. But further than this, the bow is perhaps not a stable quantity. Parts of it may vary, or the whole of it change, as the outcome of a multiplicity of factors. So with the whole of a man's bearing. From the point of view of a careful analysis he cannot speak of his bearing as one trend, acquired and fixed in a deliberate order. He has before him rather an indefinite complex. A habit is not bound by any dimensions; it is not independent of other habits; it may consist of a single elementary reaction or of a multiplicity of reactions.

The exact turning at which an activity becomes organised cannot be decided, mainly for the reason that no such turning is imaginable. Its hold even varies. Looking at a hat, we recognise it instantly as being a hat.* How far a set of reactions can be simplified and apparently detached from general thought and control is a moot point. A trend, especially when the organism is predisposed to it, might require very little effort in the acquiring. The apparently mechanical opening and closing of the eyelids, for instance, resembles an activity such as writing. In simple routine the stimulus may be so faint that though it be recognised sufficiently to be acted upon, yet it is too faint for clear recognition. Moving the eyelids with or without deliberation yields apparently indistinguishable results. This we should expect, for the process is so elementary that deliberation or absence of deliberation makes no appreciable difference. Opening and shutting my eyelids deliberately as I am writing, I cannot discover anything in the action that would differentiate it from a normal trend. No distinct feeling of effort is traceable. There is only the feeling which accompanies the movement. [*Test.*] There is present probably under average circumstances, a feeling of fatigue which is relieved by shutting the eyes. This feeling is very faint; but ordinary organised reactions have often no more distinct feelings accompanying them. In the case of moving the eyelids, there is every reason to believe that the act is initiated at birth, currents of energy being easily discharged in that direction. How far respiration and other similar processes may be classed as routine, the reader must decide for himself.

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* The learning of every word in a language, of every fact, argues organised reaction, and every word or fact so acquired implies an established trend. From week to week, perhaps from hour to hour, we are building up and breaking down temporary habits. Let me transcribe from my note book: "A certain noise made by boots. I recognise the noise and the purpose; but there is nothing present except a sense of familiarity and such feelings as might go with verbal and other images. Then, as expected—here again there is but a feeling—I feel a tap on my arm. Then a voice says, 'Are you ready?' I knew what was going to be asked of me, and so I at once quietly nod my head." Observe the total absence of verbal and other imagery. Essentially I react as I had reacted before. The creaking boots were familiar, so was the implication, so was the tapping, so was the short speech, and so was my nod. The noise of the boots was expected about that time. The moment I heard the voice, I did not so much know what was coming as felt its purport. In this way we act according to innumerable habits more or less transitory, attention being reduced whenever a thing is thought, or said or done a second time. Thus the way I turn over the pages of a book is a distinct trend, the manner in which I open and shut the door, the fashion in which I read, and the like.

Probably no distinct boundary exists. The mere absence of traceable effort, even the absence of an observable evolution in the action, applies to many processes which would not be looked upon as inherited. Every trend, by the very fact of its existence, must be considered as implying at least a modicum of predisposition. Hence the difficulty of drawing a line of demarcation.

If habitual actions tend, in one direction, to merge into bodily functions, they tend to merge into deliberateness in another. What, indeed, is to divide these classes? As we reflect we become convinced that *a vast number of actions are repeated, that the majority of our activities resemble each other, that the various new tasks we perform are new but to an insignificant degree, and that certain principles elaborated in the school of life lie at the foundation of activity as a whole.* It would be safe to state that the overwhelming mass of what is new is more or less routine in character. Again, not all routine processes require little effort. So great are the variations in this respect that while some activities scarcely make a call on our intelligence or our energy, others exclude nearly all unrelated effort and are most fatiguing.

Repetition of a process is no trustworthy guide as to the extent of the stability of an established line of action. The following illustrates one extreme. A man is required to do something which he has not attempted before, a similar cycle of actions having to be attended to about every three minutes. An instrument which he needs he puts in an awkward place. During the first quarter of an hour the mistake is pointed out to him. He agrees that he is wrong. He appears anxious not to repeat the blunder. Though only three minutes intervene between the time he is corrected and the time he is to correct himself, he yet persistently errs. Often he declares he will put the instrument in the right place, and perhaps a second or two afterwards he becomes completely unaware of his declared intent. Though his eyes sweep across the object lying in the wrong place, he does not notice it. Many like instances might be cited proving the fact that mere repetition, or extent of time, are not essentials in the growth of particular habits. The argument becomes self-evident when we reflect that present activities are based on preceding activities, and that all action is more or less organised.

While the slightest exercise, as we have just noted, may firmly establish an activity, sometimes years of constant exercise will not accomplish that object. I performed for years, and day after day, a certain action in a certain manner. Then I observed some one proceeding more intelligently. I resolved to imitate and found no difficulty in breaking with a settled custom. The next day a new era was inaugurated. No effort was requisite. No relapse ensued.

The relative ease with which an organised trend can be removed is not in proportion to the number of times the action has been repeated. For scientific purposes this must be understood. For practical purposes it is nevertheless well not to forget that habits require normally a certain time to grow, and that a vast aggregate of activities, once they become fixed, are simplified, require little effort, and are hard to remove. Though no rigorous and comprehensive statement can be drawn up, it is advisable to note the general drift of the conclusions here arrived at.

A widely-prevalent mistake must be touched upon here. Ward (*Psychology*, 1886, p. 40, col. 1) incidentally remarks: "Use we know blunts feeling and favours intellection, as we see in chemists, who sort the most filthy mixtures by smell and taste without discomfort." See also Bain, *Emotions and the Will*, 1875, pp. 80-2; Bouillier, *Du Plaisir*, 1865, pp. 21-2; Destutt de Tracy, *Idéologie*, ch. 14; Dumont, *De la Sensibilité*, 1875, pp. 77-8; Dumont, *De l'Habitude*, 1875, p. 344; Gratacap, *De la Mémoire*, 1866, who says that "the principal law of habit reads in effect that, in repeating itself, that which partakes of the nature of passion becomes enfeebled and effaced, and that which partakes of the nature of action becomes strengthened and tends to reproduce itself" (p. 205); Hoffding, *Wiederholung*, 1883, p. 323; Horwicz, *Analysen*, 1872, i, p. 360; Jodl, *Lehrbuch*, 1896, p. 388; Ravaisson, *De l'Habitude*, 1838, p. 27; Rümelin, *Reden*, 1881, i, pp. 162-3; Sully, *Human Mind*, 1892, ii, p. 33; Titchener, *Psychology*, 1896, p. 97. These authors, and many others, hold that use blunts feeling. Needless to say that the opposite is just as true— as when filthy mixtures become more and more objectionable —and that *both cases are to be explained teleologically*. We come to love our country, our parents, our habitual resorts, our avocations, in the same manner as we come to grow neglectful of objects. Indeed the whole tendency of this chapter is to prove that use blunts intellect and decomposes it when needs are in opposition or lend no support. In this manner familiar objects whose details are of no importance grow more and more indistinct because we attend to them less and less. Thus the chapters of this book become meaningless to me through incessant re reading.

65.—ALL THOUGHT IS ORGANISED.*

We have analysed a particular routine case. We have attempted, in a general survey, to arrive at a conclusion as to its essential nature. Now it must be evident that organised reactions cover an enormous area in the province of muscular action; but what position, if any, do they occupy in the more exclusively neural realm? I have reserved the answer to this question. The examples chosen, were, generally speaking, such as implied motion, and purposely so, in order to avoid prejudging the problem which we are about to consider.

Let a man imagine himself walking along a lane, playing with a ring on his finger, scanning the scenery around him, and secondarily rehearsing a poem. When he first endeavoured to repeat the poem could he have repeated it as easily as now? Not if he was a normal individual. Some practice was necessary, equivalent to that detailed in the analysis of writing, before the verses could be repeated with so little effort that there was not even a suspicion of rehearsing them. We have here a routine act, similar to that of writing, but there is an important new element. The immediate stimulus and the reaction are both present in the secondary realm. The verses proceed within. One secondary system suggests or is followed by another such system. When we first thought of rehearsing a poem inaudibly we could not help re-membering irrelevant, unessential and erroneous topics. By a process previously explained these have been eliminated. We encounter here also development, and the poem, as we might expect, runs smoothly, without interruption, and without much demand upon the attention. [*Learn to recite some poem.*]

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* This problem forms the subject of ch. 4.

Organised quality is still more clearly evinced in arithmetical practice When I am asked "What are five times five?" I answer from immediate memory and without delay "twenty-five." So in adding up columns of figures, not only is there no hesitation, but I add three or four figures at once with a like ease. When I was a child things did not proceed so smoothly. I employed my fingers, my buttons, etc., to assist me in doing a simple sum, and even then I was more often wrong than right. Immense effort yielded little satisfaction then; but to-day little effort harvests immense results because every possible instance of a certain type has been memorised. When I want to know what 1 and 1 are, I do not cast about for a reply, I answer forthwith, 2. Similarly with rules referring to mathematics generally: solutions of often-met difficulties become matters of organised memory. [*Do some mental arithmetic, and observe.*]

We have seen that in a bodily trend we do not always obtain so elementary a solution as we desire. The same thing happens, and is of special import to us, in matters of thought. Suppose a man is asked "What are 18 times 19?" (We will assume that he does the sum silently.) He starts 10 times 18, 180; 9 times 10, 90; are 270; 9 times 8, 72; are 342, or 20 times 18, 360;—18, are 342. Though the answer is reached circuitously, the successive steps are yet rigidly connected. Every move in the total act is developed like the moves in any common bodily habit. There is no halt between point and point, whether we have two steps or ten. They follow each other uninterruptedly. Their number does not affect the nature of the process.

There are many occasions in secondary as in primary routine when we take a fixed but relatively round-about course. Some one asks how many days September has. His question is scarcely finished when I begin (unheard) "Thirty days hath September," (aloud) "Thirty days." I do not ponder, nor do I answer directly. There is neither doubt nor certainty present—only what has been described.

We shall revert to these links, but meanwhile we wish to take a more general view. Do organised reactions enter into thought proper? Is there a growth of lines of thought? Does the process of judgment evolve like the process of writing?* Are observation and imagination subject to training? Does the training, if such there be, pursue the same lines as the training involved in trends such as writing? However bold it may appear, we must answer the questions in the affirmative. Let us consider the reasons which induce us to take this course.

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* "Soundness of judgment is gradually and progressively developed, all newly acquired knowledge being by degrees added to the stock of discernment, by means of whose advancing ramifications the task, which was at first difficult, and often fruitless, comes at last to be performed with the ease of a seemingly innate faculty" (Lotze, *Microcosmus*, tr., 1885, i, p. 176).

Suppose a man thinks that it would be best to dismiss certain impracticable thoughts, immediately they occur, by turning his attention into other channels. An opportunity arrives, he re-members his resolution, and carries it out. After a period of practice the resolution is forgotten or not referred to; but whenever anything impracticable suggests itself he dismisses it immediately. The resolution now forms no link between the objectionable thought and the act of dismissal. As that thought appears, so it is thrust back. There may be, after a time, entire ignorance that certain thoughts are dismissed. The man may, for instance, either deny that such is the fact, or he may give some plausible but inaccurate explanation. As with primary activities, so with secondary ones, a resolution need not be verbally conceived, nor need it be, at first, of wide application, nor need the sum of the consequences be apprehended. Much of a man's thought is as dim as the twilight, and hence there is often hardly anything definite to re-develop. An organised trend, such as the one just described, is an essential in thinking, and yet there is no appreciable difference between it and a physical activity of an organised nature.

Consider another example. Some one notices that when authors say, "There are three (or four, or more) ways of accounting for this fact," they are frequently wrong. So he makes it a rule to question every numerical statement. After a time his resolution forms no part of the thought process. Whenever he chances to meet such an expression, he ignores it, or quietly turns to investigate its correctness.

Let us suppose that a man thinks it important *to observe things directly, carefully, minutely, repeatedly, for a prolonged period, and under differing conditions;* and *to compare the observed things, in the same manner, with different things of an apparently like nature.* He may also have decided *to extend cautiously any simple proposition which he draws up or any general fact.* He may have determined *to consider in discussion one item judiciously rather than skip from subject to subject* (sec. 136). He may have made other wise or stupid resolutions for the conduct of his understanding; or he may have been taught these at home or at school; or perhaps he has gathered one detail here and one detail there; or perhaps he has imitated what appeared to him to be the method of his tutor's thought. In any case, the act which will follow the adoption of these resolutions will be of the same nature as that described when we traced the growth of writing. The road of development will be strewn with many difficulties and will pursue a devious course. In the end much of this man's reasoning will be performed in a quasi-automatic manner. The proposition or fact will be exploited in the fashion referred to. He will attend keenly, feeling perhaps a great strain without knowing it, and disputing the fact of his procedure a minute afterwards. Re-collection of theories stands in the way of rapid thought as of rapid action. Much of our limited energy would be wasted by developing them.

The preceding examples show that stimulation and training influence both primary and secondary activity. From infancy onwards a multitude of habits develop and these make up our character as practical men or as theorists. Apart from such activities it would be as impossible to think of intellectual labour as of bodily labour. Efficiency in thought depends on properly developed trends. Given reflection of a primitive kind in the child, and the course of events inevitably transforms that activity into an organised complex. Our modes of thought are thus necessarily organised.

It will be said: Granted the existence and the importance of secondary trends, we still know that they are the result of non-routine activity. The business of thought lies in forming these. They themselves are but the lifeless tools of the "ego."

Analysis is not satisfied with that answer (sec. 103). We have seen how in physiological matters one routine act really grows out of others of its kind, and how physical activity as a whole is organised. We must, therefore, urge that *every secondary trend is the offspring of other trends, which simplify as we retreat to infancy.** Let us make sure of the meaning of this statement. In a secondary series where we blunder along, vexed with doubts and difficulties, do we encounter nothing but organised reaction? When we learn our algebra or our geometry, is there in the process of acquisition as much routine as when we know them well? However paradoxical it may appear, we answer Yes. [*Experimentally observe such cases.*]

We have already observed that the number of links in an act leaves the question of their possessing an organised basis unaffected. Rationality is no fixed attribute of such an act. This we have seen holds true of physiological activities. Now all that we have to face in a difficult secondary combination is a large number of steps. A man is asked, "How many days has September?" He answers promptly, "Thirty." Or he says perhaps, "Let me see. September, did you say? I don't think I remember. I'll try, though. I believe there is a doggerel verse that might help. Confound it; I can't recall the verse. Yes, I can. 'Thirty days hath September.' I thought I could recall that verse. September has thirty days, my friend." It would be of the greatest interest to analyse exhaustively, if that were possible, such a string of thought. (See, however, the next chapter.) Here we can only state that every turn enumerated is of a kind and class that we have employed in our reflective excursions times without number.

To wonder, to be surprised, to doubt, to feel convinced, are all phases which have their place in general routine. The wonder follows immediately on something it has followed before, link on link, as we should expect. The multiplicity of links raises no problem, nor does the failure of the act to attain its end affect the matter. The fact that we have been thinking for years makes it evident that thought as a whole is a tangle of organised complexes. We doubt, as we have been accustomed to doubt. We show implicit faith, as we have done on previous occasions. We meet the various facts of life from settled, often from contradictory, points of view. Occasions being similar, we tend to react similarly. The cast of a person's character is partly traceable to this fact.

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* This disposes of Carpenter's argument that "the responsibility of the ego is shifted backwards to the share he has had in the formation of his character and in the determination of those limits" (*Mental Physiology*, 1876, p. liii). Psychologically speaking, we are, at every moment, what the previous moments have made us. No one who has closely watched the growth of children from birth onwards can put his finger on a period and say "Here began the formation of the child's character." (Sec. 214.)

It will be said that active "consciousness" is not organised when we are aware of observing something.* Why not? Are there not degrees of consciousness? Is it not the past which decides whether we shall be aware or not? May we not be clearly conscious, and be quite unconscious that we are clearly conscious? Do we not frequently attend closely, and yet, because of routine, forget the fact almost instantly? What does consciousness imply at most? That what we do is thought of in relation to other things; a conspicuous feeling and increased concentration which makes re-collection of what is observed easier; a notion of self; one combination co-existent with and referring to another; a directing a part of the attention to something we are or have been attending to. Active consciousness is consequently liable to become part of an organised whole, and since every thought and action is an organised whole, active consciousness enters into everything more or less. For the same reason, man's self-consciousness varies with training and with environment, as is evident when we consider the distance between the infant and the man.

It may be thought that the possibility of being freely re-membered is not predicable of organised processes. This is a mistake. There are few settled tendencies of which a part cannot be re-membered independently of repeating the process, and many there are, such as the case of known melodies, where the whole is necessarily membered secondarily. Some physiological routine processes are ofteh of a nature demanding re-collection, while, on the other hand, we find that the thought machinery as a whole is only open to scientific research.

Surely, it will be urged, an obvious difference remains to be accounted for. To this I agree. While holding that all activity, secondary or primary, is organised, we may yet distinguish. There are, broadly speaking, certain trends whose business it is to elaborate others—tools to create articles, or tools to create tools with. When we desire to arrive at a conclusion, the machinery starts with the very need. Sometimes the mechanism succeeds, sometimes it fails. As the machinery is brought to perfection, so the product is turned out with ease and certainty. Just as the process of writing is perfectible and gains by the judgment expended upon it, and this by virtue of its organised character, so the secondary processes are perfectible, gain by the judgment (which itself is routine) expended on them, and this by virtue of their organised character. From the point of view of special problems one kind of process may be called routine and the other not, for it depends whether we are viewing a product as machinery or as the result of machinery. Thus, for convenience sake, some combinations may be called specifically organised, and such are activities connected with trades, professions, amusements and individual pursuits generally. These trends, because they are not acquired by all, have first attracted the attention of observers. Trends which are less open to scrutiny may be dubbed non-specific trends.*

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* On the meaning of the words consciousness, awareness, knowledge, belief, doubt and certainty, see secs. 43 and 99b.

65a.—HABIT AND THOUGHT.

A study of any habit will give an insight into the nature of thought in general. For instance, I have had much to do with slips of paper, on which, in various handwritings, appear, together with some other detail, the names of different persons. If I cannot decipher a name, I look to see whether the name occurs on that slip a second time, and, if unsuccessful, I seek for similar letters on that slip or on others I can conveniently lay my hands on. When I observe one certain mark, I look for a corresponding one somewhere else. As a rule, I also carefully scan the whole slip, and that more than once. I almost always verify several times what I have presumably read. When a doubt arises, I think of similar cases to the one before me I question everything unhesitatingly. The slightest hitch or suggestion sets me thinking at once. When mistaken, I instantly halt; when more vigour is required, it is at once put forth. Most difficulties, having occurred before, are solved as soon as they develop. Even in the more persistently recurring combinations, the circumstances are scarcely ever alike, and hence readjustment is normal to the routine work spoken of.

As we analyse the foregoing analysis, it becomes progressively more evident that in every habit we have an example of thought in general; that thought in general is an example of habits; and that all habits or thoughts are more or less organised secondary complexes. A particular habit merely indicates a specially organised process. Naturally enough we re-member readily what we are frequently re-membering, and obviously enough the fact that difficulties recur insures a methodical solution. For the same fundamental reason, our individuality, both as to character and intellect, differs generally from habit to habit, *e.g.*, while flawless in our mathematical reasoning, we are probably careless in reasoning out ordinary affairs, or while a child is obedient to its teacher, it may be disobedient to its guardian (sec. 45).

Such actions as eating, walking, dressing, as well as sports like cricket, or trades and professions, are exemplifications of habit, or congeries of organised complexes. If we now ask ourselves seriously what thought is, in all its shapes, we seem bound to admit that we are here also face to face with a tissue of organised complexes. Extraordinary questions are thus organically connected with a sceptical attitude; a boastful statement is met with depreciation; an interesting event is eagerly retailed and conned over; if something is not understood, fuller inquiries are made; and the like. Each situation has its organised reaction, and most situations are of common occurrence; thus courtesy and boorishness, thoughtlessness and thoughtfulness, diligence and laziness, are, in all their forms and developments, examples of habits. For this reason alone do we feel at home in the world, and for this reason alone do we pour forth torrents of words with the greatest ease. Where the difficulties to be overcome are great, there the habits are more tortuous and unsatisfactory. Hence given that situations repeat themselves—and this cannot very well be doubted,—and it follows that the whole form of thought is adequately explained by the existence of primary and secondary complications, and that any other explanation is inconsistent with what we are most intimately acquainted with. (Sec. 215.)

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* Egger (*La Parole Intérieure*, 1881, p. 287) distinguishes between special and general habits. To-play-one-piece-on-the-piano-well, he says, is a special habit, to-play-the-piano well, a general habit. This division is open to the objection that playing the piano well is a lower form of doing things generally well, a form not to be ignored.

As against what precedes, men have argued that the "ego" thinks, wills and acts; and that the "ego" is the thinker. This doctrine is not easily sustained. First, the facts require no "ego" to explain them.; for, as we have seen, they explain themselves The "ego," as conceived by some, is a relic of the Middle Ages, and ranks with the essences and substances so fitly ridiculed by Molière and by Locke. One might as well speak of a stony substance underlying stones as of a thinking substance in thoughts: the one as little as the other promotes a better understanding of the facts of existence. On scientific grounds we can see why thought flows in certain particular channels; but if we restrict ourselves to the "ego" theory, it becomes in any given instance a hopeless riddle why one combination emerges rather than any other.

It might perhaps be thought that the instance analysed is an exceptional one. To obviate such an objection I wish to say that I have for periods together carefully watched my habits and my actions generally, and that the above analysis contains but the barest outline of what is the result of very many observations. The advanced student can do no better than follow in this case the example set, and occasionally watch his activity from morn till night, observing himself walking, talking, dressing, hearing, seeing, masticating, using his tongue, teeth, jaws, hands and fingers, and reacting to the innumerable situations in which he is thrown day by day. If he then wishes to understand how he came to react so readily, let him watch the development of an infant.

66.—THE PSYCHOLOGICAL METHOD.

If our analysis of organised reaction be correct, then we are obliged to draw important conclusions as to the proper psychological method of investigation. An organised trend means a simplified trend—one where almost everything unessential is rejected and forgotten, where effort is reduced nearly to a minimum, where the present is treated in the light of the past, where the bonds of time and order are absent, and where reaction accompanies its customary stimulus. When, therefore, we speak of reasoning and thinking, or imagining and willing, or feeling and pleasure-pain, and allow that they are routine activities or developments, it at once follows that, by themselves, these processes—though they adequately serve their respective purposes—lack intelligibility from a psychological standpoint, just as the fully developed process of writing does. They can only be explained organically and with regard to the past. Whatever they were in their earlier stages, they are now entirely transformed. To expect to find in them connected and self-consistent wholes, such as our ill-guided imagination might create, is out of the question. Hence careful observation alone can offer a clue to the various modes of reflective activity. To deduce these modes from principles not based on the previous study of the special facts is as disastrous as thus to deduce the functions of the brain. *The explanations which have been proffered must, accordingly, be interpreted so as to include the acquirements of children, savages and animals, as well as the highest flights of genius and all normal thought and action.*

67.—A BIRD'S EYE VIEW.

The struggle for existence and comfort solves the riddle of the evolution of animal life.* Had each species possessed in plenty what it required, the *raison d'être* of transmutation would have been absent. So is it with the evolution of organised thought. If attention energy were indefinite in quantity, all combinations might develop peaceably side by side, except those which are in their nature opposed to each other. There would be no organised reaction. We should take an interest in everything and forget nothing. But attention energy is limited, while our desires tend to be boundless. Hence a struggle for the field of attention ensues, as the result of which thought is simplified.* On the widest view, therefore, the existence of organised forms of activity is explained by the struggle of varying interests for the narrow field of attention.

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* The notion that evolution follows from the struggle for comfort rather than from the struggle for existence, is elaborated by Rolph, *Biologische Probleme*, 1882.

Additional References.—Angell, *Habit and Attention*, 1898; Beaunis, *De l'Habitude*, 1856; Radestock, *Habit*, 1886; Rümelin, *Ueber das Wesen der Gewohnheit*, in his *Reden und Aufsätze*, 1881; and Vogt, *Ablenkbarkeit und Gewöhnungsfähigkeit*, 1899.

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* Science has been termed an economy of thought, a shorthand of knowledge, a simplified view of things, a compressed formulation of facts, a brief statement of what is observable, and the like. If this very plausible standpoint be correct, we have in it a striking illustration of the principle of economisation. According to our reading of the facts the following happens in the evolution of truths. Surrounded by innumerable interesting things of most varying aspects, we try hard to comprehend them. Since little time is at our disposal, we make desperate attempts to reach the simplest possible formulation of the world of facts, and in these attempts lies defined the object, motive and method of science. Apart from the process of economisation, therefore, science, with all its implications, has no meaning; and, for the same reason, every truth, every statement, and every generalisation, owes its existence solely to the process described in this chapter. (On the nature of science, see Pearson, *The Grammar of Science*, 1891; Mach, *Beiträge zur Analyse der Empfindungen*, 1886; and especially Avenarius, *Philosophie als Denken der Welt gemäss dem Princip des kleinsten Kraftmasses*, 1876.

CHAPTER IV

SYSTEMS AS NEED-SATISFYING

Round our needs—our weal or woe,
Trains of thought luxuriant grow.

68.—What is Implied in a Secondary Unit or Idea?[*]

I say to myself "Have I seen that face before?" Forthwith there ***shoots up*** a picture,[†] and I answer my query with an emphatic "Yes." [***Do images occupy sensible time in developing? Experiment.***] What precisely, it may be asked, is the crucial factor which makes me answer in the affirmative? The question, as we notice, was followed by a particular image the features of which I could trace almost to the daintiest detail, having observed and scanned them a few minutes previously. Apart from what has been described, relevant matter was absent. No sound, no touch, no action, no connected systems, no pleasure-pain, no estimate of the man's intellect, beauty or goodness, was re-produced with the visual image. Nor was any feeling present which might be called the feeling of relevant re-collection. The image pure and simple stood by itself. [*Test in your own life.*]

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[*] I have called a percept or an idea a compound, because in a compound a system of sensations or images is involved. Such compounds, again, are the normal units of thought rather than the integers of which the compounds are composed. If, however, we consider a unit of thought to be a compound, then we reach the somewhat unsatisfactory conclusion that compounds are often integers, since the unit of thought is sometimes an integer. We must, therefore, either re-define our terms or employ fresh ones. For practical purposes, we shall hence ignore the occasional contradiction involved; but for theoretical reasons we may speak of a unit of thought or action as a primary or secondary unit, or a combination unit.

[†] The phrase "Forthwith there *shoots up* a picture," raises the problem of how far sensible time is occupied in the development of any image. I have experimented to a considerable extent, and the conclusion suggested is that, in my case at least, no development is *noticeable*. A face may immediately present itself, or when time does elapse, that time is contentless as far as the face to be re-collected is concerned. If a landscape is to be re-developed, or the features of an absent face are to be separately observed, the time elapsing is accounted for, as in ordinary sight, by the continuous sweep of the attention in its endeavour to re-cast the face or the scene. If written words are re-developed, there is equally time spent in reading the words. If words are written in the imagination, the characters develop, as far as sight is concerned, precisely as in writing with a pen. Even when in thought a name can only with great difficulty be pieced together, there is still no sign of growth in the image. Under these circumstances we have to allow that to all intents and purposes images, like sensations, *shoot up* and do not develop, as far as observation is concerned.

The re-developed face constitutes at the time being the whole idea of the man, for nothing beyond that face is implied immediately. Furthermore, when an image is produced as we put a question such as we started with, affirmation ordinarily follows. It can be shown that no vital bond exists between the image which results and the true answer. For instance, it happens not infrequently that instead of re-membering X, we mistakenly and unsuspectingly re-member Y: thus we may be convinced that we have met a person, when we have only seen his portrait or have not seen him at all. [*Observe such occasions.*] In this manner, especially where there is profound organic disturbance, as in insanity, replies to questions are often beside the point. Again, when we know that we are liable to mistakes along certain memory lines, as happens occasionally, we proceed, as a precautionary measure, to re-collect additional details, *e.g.*, the man's voice or the place where we last met him. [*Test experimentally.*] If, after taking such a precaution, we find that the items form a system, we consider our conjecture confirmed; but if no other connected aspect be re-producible, we remain in doubt. Hence we conclude generally that the image did constitute a secondary unit, and that its prompt appearance argued its relevance. The notion of the man, however, was not involved in logical completeness in the image, since the full notion consists of the total that can be re-produced in connection with him, consists, that is to say, of the universe of memories. In so far as we thus re-member relevant details, so far do we exhaust and exhibit the notion of the man. On any particular occasion, on account of the nature of the brain, there is re-membered, as we shall see, that which is relevant, and it is that which constitutes the relevant unit or idea. From a psychological point of view, therefore, we must insist that a secondary unit is no more complex than it appears to the careful psychologist, *i.e.*, that the secondary unit or idea *means* no more than it says. It is not necessary that everything remotely or closely pertinent should be developed in its true or in a changed form. The reason for this we shall learn in the sequel.[*]

69.—Richness and Poverty of Detail in a Secondary Unit or Idea.

We assumed the re-instatement of a face which was to all intents and purposes indistinguishable from reality. Such completeness, as observation teaches, is the exception rather than the rule.[*] Thus, to take an extreme instance illustrating poverty of detail. About seven years ago I saw a certain acquaintance for the first time. Since that period I have met him on countless occasions, and when I think of him it is usually that first image which re-appears. The detail was at first, without much doubt, present in profusion; to-day the most careful scrutiny reveals but a patch of shady black which defies analysis. [*Recall a quantity of old and recent events and note the detail.*] It is as if wind, frost and rain had for years wrought their spite on a picture, and had effaced colour, form and meaning. This patch of shady black, without regarding its slow devolution, is as truly a unit as was the thoroughly re-produced image of the acquaintance two minutes after he was met for the first time. Though the two images differed considerably in the amount of detail which they possessed, yet one as much as the other was merely a relevant unit or idea. Given the two extremes, and it will be readily understood that all possible intermediate degrees of resemblance to reality must be judged by the same standard.

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[*] Many authors have been struck by the apparent emptiness of ideas, and have tried to explain the anomaly. Dr. Stout has attempted to overcome the difficulty by maintaining as a general theory that there exists the idea as well as its meaning or significance. Thus he says: "A hearer who knows the multiplication table knows what follows as a whole without detailed repetition. The beginning of the series is equivalent to the whole, and it is just because it *means* the whole that it is unnecessary to repeat the whole in detail" (*Manual*, 1898, p. 85). Now when anyone hears for the first time the phrase *cui bono?* he is not satisfied with the assurance that the words have a meaning, for he wants to know what that meaning is. Dr. Stout, if I understand him aright, never goes beyond the first step of assurance, raising his suggestion apparently into a metaphysical construction (*ibid*, p. 616). We shall now see that the meaning lies not behind an image or a word; but in the possibilities of revival, and in the simplified trends connected with such revival.

James Mill admirably and fearlessly expresses the common opinion that words or ideas have adequate contents. He writes: "If I say, I have the idea of a horse, I can explain distinctly what I mean. I have the ideas of the sensations of sight, of touch, of hearing, of smelling, with which the body and actions of a horse have impressed me; these ideas, all combined, and so closely, that their existence appears simultaneous, and one. This is my idea of a horse" (*Analysis*, 1869, i, p. 234).

70.—EACH OF THE FIVE SENSES SUPPLIES US WITH THE MATERIAL FOR SECONDARY UNITS OR IDEAS.

A unit may consist, as we have learnt, of a single visual image of indefinitely varying content; but yet units of a different order are nearly as common. Just as the affirmative reply followed the presence of the imaged face, so a similar answer would have been forthcoming, if a laugh, a lingual utterance or the creak of boots had been re-instated, vividly or otherwise. An auditory image has precisely a like value with a visual one, for both serve the same purpose, and they can each play their parts unsupported. And what is true of these two senses, is true of the other three, allowing for the efficiency of the sense apparatus and for the ease of re-production. Similarly, the idea may be built up of portions derived from more than one sense. [*Test whether you can re-collect in terms of all the senses.*]

71.—OTHER SOURCES OF SECONDARY UNITS OR IDEAS.

The five senses supply a fraction only of what generally may go to the formation of a unit. I admired the man, perhaps, for his appearance, and the notion of him is represented by a secondary gaze or by a feeling of admiration. His behaviour, it may be, made my lips curl with contempt, and that curl alone is reproduced. He inspired me possibly with disgust, and that feeling may be the part re-developed. He may have set me thinking, and that attitude is likely to re-enact itself. He may have angered me or pleased me, and these feelings are perhaps repeated more or less completely. Indeed, emotions and feelings are the usual stimuli to the memory. With me, at least, what is usually re-collected is that which is peculiar to the person or which marks his relation to me. [*Experimentally test in your own memories.*]

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[*] I notice that in re-membering postcards or letters from friends, printed pages generally, and wide prospects, I obtain a faithful general view with the intelligible detail missing. Thus, though I recognise the writing in the letters, yet not a single word is readable. Where things are well known, the view changes according to relevancy. That is to say, I may have a vague image of a friend in a room where I superficially see much, or perhaps I just image his face, his eyes, his lips or his nose. In imaging as in sensing, therefore, the picture changes according to the part focussed or attended to.

As against systems derived from sense elements, some psychologists enumerate certain "inner" characteristics as desires, emotions, volitions and thoughts. It is as if all simple brick structures up to a cottage were called bricks, and were strictly divided off from other brick structures which were called houses, mansions and palaces. If we analyse a desire, hunger for instance, we meet a certain humble or simple feeling which is secondarily connected with the notion that the stomach requires something, with a muscular and nervous uneasiness, and so on. This rooted desire is hence a bare feeling rich in connections and in possible meaning: and, therefore, but slightly more complicated than a passing visual act. We may thus regard a certain object as a curiously shaped closed vessel made of metal and filled with hot water, or, looking beyond its appearance, to its known use, we may call it a foot-warmer. In this manner desires, volitions, emotions, thoughts, and their like, cannot be classed apart; for they are only somewhat more highly developed compounds than common sensations, or, what is the same thing, they are systems rich in possible connections, systems which derive their names, their distinctions and their importance solely from the processes with which they are connected. [*Analyse hunger, thirst, fatigue, etc.*]

Höffding and others deny independent position to a feeling. "In the province of the feelings nothing is found corresponding to the laws of association of ideas" (Höffding, *Psychology*, 1891, p. 275). Godfernaux and others, on the contrary, lay stress on the driving force of feelings. "If ideas associate, it is because feelings bring them together. In themselves, ideas have no special affinity for each other" (Godfernaux, *Le Sentiment et la Pensée*, 1894, p. 202). And on p. 203 this author concludes generally: "The phenomena of consciousness act and react on each other, and associate among each other like the motor phenomena to which they correspond." Stout (*Psychology*, 1896, p. 271) says: "Pleasures as such and pains as such are not immediately associated with each other, and it does not appear that they are, properly speaking, associated with presentations or active tendencies." See also Dumas, *L'Association des Idées dans les Passions*, 1891; and Ribot, *La Mémoire Affective*, 1894.

72.—SECONDARY UNITS AND IDEAS WHICH ARE GENERALLY OVERLOOKED.

Let us now deal with a peculiar class of units. Very faint images will be almost certainly overlooked by an ordinary individual who seeks for them, since only with persistent training comes the capacity to detect blurred traces. Yet there is another group of facts which should not be passed over. Along with the same class of grouped systems the same tolerably definite but unaggressive images are often re-developed. In many of these cases the images never give rise to reflection, and cannot be re-developed apart from the combinations to which they are attached. They come and go like the shadows of the clouds on the sea, without leaving any lasting impression They generally, among other things, underlie our intuitions with regard to the appearance or character of those we meet, and our philosophic notions. There is here relevant re-collection which is only traceable by close introspection (sec. 126). [*Deliberately watch the stream of thought for these unaggressive memories.*]

73.—WORD-IDEAS AS SUCH.

Circumstantial re-instatement is always out of the question, and it would be unwise, therefore, to think that every time I hear, for instance, the voice of my mother I recollect everything I know of her. But partial re-instatement of a context, in the common acceptation of that term, is equally absent as a rule. I thus peruse a paragraph of twenty one lines without chancing on a single picture. Such words even as *clergyman*, *garden party*, *botany*, *curate*, *Herrick*, *High Churchman*, *Worcestershire* are apparently unaccompanied. With terms like *lofty*, *mean*, *pleased*, *disgusted*, *slow*, *quick*, *sharp*, *sour*, *thick*, *thin*, *thunder*, *lightning*, *love*, *hate*, *anger*, *tears*, etc., I observe usually a distinct and special way of pronunciation. There is residual action or feeling in each of the words, a fact which makes men think that such a fair-sounding word as thunder has thunder in it, when it is the manner of utterance which alone supplies the grimness and the force. However, when we read quickly, the variety of emphasis is almost lost. [*Is it?*] In words of common occurrence no distinctive accompaniment is observable. Take for instance the words by themselves in "It is the manner of utterance which alone supplies the grimness and the force." In this sentence the majority of the terms have but a familiar sound and no more. They are word-units, the expression "utterance," no more and no less than the expression "which." [*Experimentally test step by step.*]

Taine (*On Intelligence*, 1871, p. 4) holds a different view: "However briefly we retain the word, the image to which it corresponds commences to form; the image accompanies the word in a nascent state, and, though not actually formed, acts on us as if it were." Stout's view will be found in his *Psychology*, ii, pp. 78-96.

74.—WORDS RICH AND POOR IN MEANING.

The apparently meaningless words just referred to are empty and meaningless as such. They display a special content only when we pursue our inquiry, as when we ask "What do you mean by 'manner'?" Then, according to circumstances, a multiplicity of details is disclosed. But this question merits closer consideration. [*Ask yourself the question as regards all the words in this paragraph.*]

When we first meet with such a term as "philosophy," the term means almost nothing to us; it is a word we read, but know nothing about. We may never strive to understand its meaning, and then the word to the end of our life has merely a familiar ring. It is otherwise with the philosopher who has read and studied the term in innumerable contexts. The word is highly expressive for him; that is to say, while usually lacking distinctive accompaniment, it is possible for him, if he so desires, to gather round it a varied mass of relevant matter. It is to this we refer when we say that a word is rich in meaning. On the contrary, when we speak of a word being poor in meaning, we are not thinking principally of the immediate absence of detail, but of the impossibility of making of it, without further study, a centre from which radiate many stately avenues of thought. A word rich in meaning can be attached to many systems; a word poor in meaning has scarcely any relevant connections. To put it briefly, by neglecting the process of frequently hunting up the various relations of a word which is rich in meaning to us, its significance, through forgetfulness, is gradually, perhaps unsuspectingly, reduced until the word resembles an empty picture frame. [*Test experimentally.*]

75.—WHY SECONDARY UNITS OR IDEAS TEND TO HAVE LITTLE CONTENT.

The stream of attention in those who are awake, proceeds equably in strength and swiftness, and is amenable but to slight alterations. (Ch. 2.) At the same time our needs frequently outrun our immediate power of satisfying them in full. (Ch. 7.) Hence a tendency develops to economise the attention, and, as a result, we attend, generally speaking, to things no more than we are compelled to. This process explains the relative emptiness of words and imagery. Instead of re-membering all I could about the man, I only re-produced his face. Instead of re-producing his face distinctly, I re-produced a faint patch. Instead of re-developing a faint patch, I only gave individuality to the name. And lastly, the mere name alone, given a context, must suffice. Thus, through anxiety to report progress, units are steadily divested of detail, that is to say, we suppress the irrelevant images or take no measures to re-call them. By a similarly effective process the immediate meaning of words is gradually reduced till, as we have seen, it often reaches the zero point. According as we imagine our nervous system changed, so these results would be different, for needs, theoretically regarded, are not of necessity infinite in their exactions, while attention may be indefinite, or distributed unequally in time, so as at once to satisfy any need. As Stout (*Manual*, 1899, p. 407) says: "Only so much need be revived as may be required by the dominant interest of the moment." [*Test experimentally.*]

76.—SECONDARY UNITS OR IDEAS REFLECT INDIVIDUAL SITUATIONS.

I have re-developed in steady succession nearly all my friends and acquaintances. [*Do the same.*] In a similar way I have thought of various objects with which I am familiar. [*Do the same.*] In the first of those cases every image reflected an individual situation. [*Is this so with* *you?*] In no instance was there traceable any superimposing of images, a truth which can be experimentally tested. I do not see a face which is looking in no particular direction; I see one looking in the same direction as on a particular occasion. With repeated observation new items are added to the old until almost every detail of the face can be re-developed. Hence the completeness is the result of varied activity and not of superimposition through humdrum repetition. When, on the other hand, familiarity and varied situations induce neglect of detail, then it is some blurred form of an individual image with which we are dealing. As with persons, so with things. Neither experiment nor observation yields generic images. Indeed, as we have seen in the last section, ideas which are frequently employed, will, as a rule, lack accompanying imagery. Fancy a generic image for "Universe," "general idea" or "everything"! Their meaning lies rather, as we shall see, in the connection which the words can enter into with others and in the selected points which differentiate the meaning of terms. [*Carefully test the whole paragraph.*]

76a.—GENERAL IDEAS.

"When we use the word battle, the mind runs over the train of countless acts, from the beginning of that operation to the end; and it does this so rapidly, that the ideas are all clustered into one, which it calls a battle. In like manner, it clusters a series of battles, and all the intermediate operations, into one idea, and calls it a campaign; also several campaigns into one idea, and calls it a war" (James Mill, *Analysis*, 1869, i, pp 329 30). The despatch, if Mill be correct, must be rapid beyond all imagination; for while the lightning is not so swift but that we seemingly collect a faint impression of motion, yet with these complex ideas, the most painstaking and prolonged inspection reveals not as much as would a rushlight in the heart of a thick fog. There are several objections to this theory which follows along the line of Dugald Stewart's doctrine. (1) We cannot review past scenes more quickly than can the senses which keep us in touch with the outer world. An attempt to see things with much greater speed than usual, ends in vagueness, confusion and fatigue, and the same applies to secondary vision. (See, however, Egger, *La Parole Intérieure*, 1881.) I re-instate related happenings with almost machine-like regularity and speed, about two-thirds of a second passing between picture and picture, or idea and idea, when they form no sequence. Endeavours to increase the rate of motion are fruitless [*test this*], a tendency to haste producing a fall in the quantity of what is imagined, or introducing confusion and fatigue. Hence, the known flow of imagery being measurable, we are totally opposed to admitting a rate of ideation which is vastly beyond anything that is verifiable. (2) The elder Mill's theory implies a perfect memory, and yet the overwhelming mass of what is at first re-membered, is very soon forgotten. This is made evident in the observation that if I had asked Mill for an explicit statement of his idea of a battle, I should have obtained a few grains of value instead of mountains of information. Similarly, as time passes, the words Thirty Years' War may have lost their entire contents. To this it would be idle to answer that all the details gallop by as a body and are re-collected as such, while they are otherwise unavailable for use. (3) Compression can only proceed when there is something to be compressed. "Smith's hat," "the top of Mont Blanc" or "yesterday's buttonhole," appear in secondary as in primary systems, and these would hence be the idea or unit of thought. So also is it with two or three objects; for these are readily re-produced, though no gradual increase in compression is traceable. On every ground, then, the compression theory must be dismissed. [*Experiment as to compression.*]

The subject of general ideas has formed an important centre of discussion. Locke quaintly sums up the matter as regards the general notion of a triangle: "The general idea of a triangle . . . . . . must be neither oblique nor rectangle, neither equilateral, equicrural, nor scalenon; but all and none of these at once" (*Human Understanding*, 1689, bk. 4, ch. 7, sec. 9). Berkeley, in his Introduction to his *Treatise*, 1710, makes merry over Locke, contending on his part that "an idea which, considered in itself, is particular, becomes general by being made to represent or stand for all other particular ideas of the same sort" (*ibid*, sec. 12). Hume, agreeing with Berkeley, resolved the riddle as follows: "All general ideas are nothing but particular ones, annexed to a certain term, which gives them a more extensive signification, and makes them recall upon occasion other individuals, which are similar to them" (*Treatise*, 1739, part 1, sec. 7). A favourite modern theory is the one propagated by Galton, to the effect that a generic image resembles a composite photograph. We persuade, for instance, thirty mathematicians to oblige us; and we photograph them each, one after the other, on one plate, when the developed photograph will show a typical mathematician. Similarly we proceed with thirty costermongers, and the difference between the characteristics of the two professions are in that manner supposed to be revealed. In accordance with this Galton tells us that "our general impressions are founded upon blended memories" (*Inquiries into Human Faculty*, 1883, p. 349). Here is a full description of Galton's theory as understood by Huxley, *Hume*, 1879, pp. 94-6: "Now, when several complex impressions which are more or less different from one another—let us say that out of ten impressions in each, six are the same in all, and four are different from all the rest—are successively presented to the mind, it is easy to see what must be the nature of the result. The repetition of the six similar impressions will strengthen the six corresponding elements of the complex idea, which will therefore acquire greater vividness; while the four differing impressions of each will not only acquire no greater strength than they had at first, but, in accordance with the law of association, they will all tend to appear at once, and will thus neutralise one another . . . . . . Thus our ideas of single complex impressions are incomplete in one way, and those of numerous, more or less similar, complex impressions are incomplete in another way; that is to say, they are generic, not specific. And hence it follows, that our ideas of the impressions in question are not, in the strict sense of the word, copies of those impressions; while, at the same time, they may exist in the mind independently of language. The generic ideas which are formed from several similar, but not identical, complex experiences are what are commonly called abstract or general ideas." [*What will be the generic image of a person whom you have seen four times, facing four directions?*] In criticism it is but necessary to refer to the remarks made above on James Mill, and to appeal to deliberate experiment which is here open. Whether, in *some* sense, there is truth in the contention, is another matter. By implication, we have dissented in the text from Taine (*On Intelligence*, 1871, p. 397); from Prof. Ward (*Psychology*, 1886, p. 62, col. 1), who supports Galton, as also from Dr. Stout (*Manual*, 1899, pp. 406-7), who agrees with Prof. Ward. Sully (*Human Mind*, 1892, i, pp. 415-6), while agreeing with Galton, yet holds that a general idea is a generic image *plus* the clear consciousness that it represents a class of things.

We saw in sec. 69 how, with time, images lose much of their detail. What is true of the example given in the section referred to, holds very generally. For instance, when some one chances to mention horses to me, I think of some particular one I have known. In time the image becomes not only more and more patchy and scrappy, but the history of the image also fades till it disappears. When, at this stage, the patch of shady black—an apology for a horse—is recalled on thinking of a horse, we imagine, or are tempted to imagine, that this shadowy individual is the result of superimposition of all the horses we have seen, as in composite photography. In my view, these images cease to be connected with a particular situation, and are degraded individual images.* [*Experiment.*]

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* "The images of our past experiences, of whatever nature they may be, visual or verbal, blurred and dim, vivid and distinct, abstract or concrete, need not be memory images, in the strictest sense of that word. That is, they need not rise before the mind in a marginal fringe or context of concomitant circumstances, which mean for us their *date*. They may be mere conceptions, floating pictures of an object, or of its type or class" (James, *Talks to Teachers*, 1899, p. 144).

76b.—SPEECH AND THOUGHT.

Language being the chief medium by means of which we absorb the wisdom of our fellows, it plays necessarily an important part in the secondary life. Yet that must not blind us to the fact that thought is not always dressed in words, but repeatedly roves about garbless. Thus walking through the meadows, I turn to examine their appearance. My eyes fasten on a large variety of objects known and unknown. Though clearly observing what I am otherwise acquainted with, yet owing partly to the swiftness of membering, thought remains wordless. I admire this flower; I linger over that patch of tall grass; I follow the outlines of the trees; I observe the course of the brook, and note its silvering with the sinking light of the sun; I note the cows grazing, or resting, or driving the flies off, or turning their great eyes on me. My interest in the scene is vivid and continuous, and my brain is busily engaged. [*Record such instances.*] We already saw in ch. 2 that primary and secondary systems imply attention and are one with thought. How much more true is this where wonder, admiration, reflection, absorption, close observation, fond lingering, are added. *Thought is involved in the faintest dawn of sensibility as much as in the formation of the most abstract proposition. It is one with what is great and small, humble and proud.*

To test the possibility of wordless thought I enact a pantomime in the imagination. [*Experiment in this direction.*] I imagine an elastic cord to which is attached a dummy baby. I swing the latter about an imaginary room, and observe how it strikes against the floor, walls, ceiling and furniture. I approach an imaginary window (it is on the third floor) and dance the doll about. Now it touches the road below; now it bounds up to the sky. I vary the direction and the rate of the motion constantly. Now the elastic band describes a tremendous circle; now it swings to and fro; now up and down. This fooling is unaccompanied by words. I think of all kinds of things to do: I vary the conditions incessantly; I imagine new possibilities; yet all without verbal assistance. Here I am not, as in the meadows, guided by what is outside me; nor am I merely enacting some scene which I re-develop. I project a series of events on the screen of the imagination. I construct combinations. Here is the higher kind of thought applied frivolously, the creative faculty in action.

Sustained speechless thought is not frequent. [*Test this.*] Nevertheless, whenever we watch a process, as in chemistry or in mechanics; whenever we observe some person or issue; whenever we tentatively experiment in thought or in fact, we are apt for a considerable period to dispense with words. [*Verify this.*] Such speechlessness is not by any means rare. An ordinary conversation, for instance, is not sufficient to exhaust the normal demands on the attention: our eyes, as a consequence, wander, alighting now on this object, now on that. Hence the restlessness so commonly observable. Perhaps, while talking, we study the construction of the piano, its shape, colour, size; or our eyes rest consecutively on the pictures in the room. [*Verify.*]

Note, for instance, a number of individuals at ease [*observe at first hand*], or better still, observe closely, without being observed, the eye movements of a person not specially engaged. So quickly do the eyeballs turn to right and left, upwards and downwards, that it becomes painful and confusing to keep pace with them. Just as a bell in the hands of a quicksilver-tempered master speaks to the servant of good humour, of laziness, of indifference, of fatigue, of irritability, of anger, of fury, and so on, so the eye movements form a reflex of passing thought. Now there is a slow excursion to the right, then a quick come-and-go movement to the left, indicating hesitation; now the gaze is firmly fixed, pointing to interest; now the eyes seem drawn to an object, arguing curiosity; now they are rapidly surveying an object, and now they indolently move about as if in search of something. That these swift turnings to and fro are not mechanical, we can easily decide by self-observation; that they are what they appear to be, *i.e.*, intellectual processes, we can determine in the same manner. However carefully I analyse my states under such circumstances, I can see no reason to doubt that there is nothing to differentiate speechless eye movement thought from the severest intellectual exercises. The elements in both are precisely alike. Experiment in this matter, is, of course, not difficult, for any friend or fellow student should be willing to have his eyes watched while we pass and repass a hand or some object before him. These facts have an important genetic or developmental bearing. An infant about fifteen months old certainly behaves somewhat like an adult at ease. His leg movements, his hand movements, his eye movements and his play generally, indicate that topical reaction is common with him. Doubt, belief, desire, will, want, hesitation, judgment and similar states, can apparently be traced. [*Can they?*] This means that a child who is not yet initiated into the mysteries of language, thinks briskly nevertheless. By observing these outward expressions of an inner spiritual being in man and child, we ought to approach a reasonably safe interpretation of child thought. It is superfluous perhaps to mention that the highest types of apes show similar eye movements (sec. 233), and that animal intelligence generally is capable of being investigated as we have proposed to investigate the child's individuality. In this section our chief interest in these swift eye movements lies in the fact that language is excluded by reason of that very swiftness. Hence thought without words and with occasional words is normal.[*]

Max Müller (*Three Lectures on the Science of Thought*, 1888) apparently opposes our view. He says: "We think in names and in names only" (p. 50). "We may see a dog, but if we ask ourselves what it is, if we want to know what we see, we can answer by the name 'dog' only" (p. 56). "May I make the modest request that some philosopher by profession should give us a definition what language is without reason, or reason without language?" (p. vi). "We can as little think without words as we can breathe without lungs" (p. 47). But the learned philologist is scarcely consistent, as we shall now see. "If there is no such thing as a mere name, neither is there such a thing as a mere thought or a mere concept. The two are one and inseparable" (p. 50). "If we mean by thinking, perceiving, enjoying, remembering, fearing, loving, and all the rest, we have no grounds for denying animals, particularly the higher animals, the possession of these qualities" (p. 93). "They [animals] may think in their own way. Their way of thinking may be, for all we know, more perfect than our own. . . . I cannot allow that they think, if we define thinking by speaking" (p. 94). "By long usage speech has become so abbreviated that, as with mathematical formulas, one sign or letter may comprehend long trains of reasoning" (p. 49). "Holding up three fingers is as good a sign for the addition of one, one, one, as the sound of three. Shaking the fist in the face is as expressive as saying 'Don't'" (p. 93). And to crown all: "Thinking is nothing but speaking minus words" (p. 27 of the attached correspondence). Cf. Müller's larger work, *The Science of Thought*, 1888.

Galton's letters in the correspondence bear out our contention. It must not be forgotten that WORDS ARE ONLY VISUAL, AUDILE OR MOTILE IMAGES.

See also Ribot, *Enquête sur les Idées Générales*, 1891, and *L'Evolution des Idées Générales*, 1897; and Marchesini, *Sur les Idées Générales*, 1893.

77.—RE-PRODUCTION OF MOTION AND DETAIL.

The footprints of economisation are observable in every direction. In theory and speculation one may assume in any instance a large quantity of compressed, of suppressed or of half-noticed detail; but in practice and experiment we discover nothing of the kind. For example, I know a certain large office intimately. If I so wish, I can traverse in thought many of its passages, rooms and staircases. In ordinary thinking, however, the notion of the journey between brick walls, is expressed by a fleeting picture,—a fraction of the whole space traversed. [*How is this*

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[*] It would be interesting to study a case of loss of language with non-suspension of thought.

with you?] Thus when I think of a certain person whom I saw cross the road, I have in view but a certain insignificant stage of the total act So a running match which I witnessed, is represented only by a few snap shots. Or to take a special instance, I am in a train, engaged in watching the passing-by of objects, for the purpose of re-producing the objects as moving. I cannot re-call afterwards all I had observed. I seem to reproduce faintly the movement attended to in watching the appearance and disappearance of the telegraph poles which border the line, but even in this I am assisted by the extreme simplicity of the poles and wires as compared with the houses and trees, which I find myself unable to reproduce in the same way. We do not, then, mechanically follow in thought the development of a series of objects in motion. A few momentary impressions form the limit of what men generally obtain, our vision being kinetoscopic, but our imagery barely photographic.

As with movement, so with quantity generally. If we think of a walk down a certain road, we do not pass in review all that we have observed there. A single inward glance may suffice, or perhaps this or that shop is portrayed. Similarly when we picture a day's stay in a certain town, a view here and there presents itself, with nearly the whole of the detail omitted. So when we think of our journey round the world, or of the Hundred Years' War of which we have read, casual strips are alone redeveloped. As a single picture, therefore, is reduced to a doubtful shadow, so quantities of pictures, stationary or in motion, are in ordinary thought equally deprived of almost their total contents. *Possibility* of the revival of detail, *when necessary*, takes the place of mechanical and wholesale re-production; and when such revival is not encouraged, a solitary and isolated shred of an image or a feeling constitutes sometimes our only secondary possession The quantity re collected at any time is hence not in direct proportion to the contents of the past events. [*How good is your memory?*]

Since the process of economisation is teleological and not mechanical, we must only seek for consistency in principle. Thus when thinking of mammals, there often occurs to me, as an accompaniment, the cast of a young hippopotamus. This image is, of course, partly irrelevant and wholly unnecessary. Often, again, we think of a special image, because the re-collection of that, *e g*, a certain kangaroo in a certain place, assures us that any feature which we are in search of may be re-developed. For such reasons images are frequently unnecessary and often indirectly relevant. [*Bird, fish, dog, mat, tree, door, walk, fly, box, picture, sand, lamp —what images were observed by you as you read the preceding words? Go now through the list deliberately*]

To return from our digression as to redundant imagery. In walking up a hill, my attention is occupied with a certain oak tree which I am slowly approaching. [*Test.*] If the movement of my limbs is continuous, I have collected apparently a huge number of pictures of that tree, ranging from initial faintness and meagre detail to growing vividness and rich detail This mechanical view is incorrect, for observation is casual and not continuous, since the focussing process is more or less irregular [*Test carefully look about you.*] Assuming continuity, however, we note that the vastly overwhelming proportion of what has been certainly observed, cannot be re-developed. Only this or that view recurs, owing probably to the fact that retention requires a degree of attention which is not continuously at our disposal. [*Note how far you re-member fleeting observations*] For days we may thus absorb the many sights we see and the sounds we hear, with much the same result. That is to say, while continuous observation is normal, continuous re collection of what is so observed is not normal to the human structure (Sec. 117)

78.—OBSERVATION IS TELEOLOGICALLY DETERMINED.

If we wish to measure quantitatively what we re-member, we must first determine the quantity which we observe Suppose I look for a few moments at a good photograph—a foot square—of a portion of the Thames Embankment in London [*Repeat with some such picture*] After a few seconds I look again, and I then detect details which escaped my first inspection In this way repeated analysis has ever fresh surprises in store. This visual process is obviously at total variance with the process of photography, where every exposure yields the same outlines, and where repetition of exposure, or substitution of camera, leaves the situation unaltered Let us exchange the photograph for a piece of nature Sitting before a clump of trees, constant attentional readjustment, like a stream, untiringly changes the matter of observation [*Repeat*] What is seen at the first glance, is, therefore, trifling when compared to the total to be observed, while the imperfection of the attention at any one moment can best be tested by turning to an apparently featureless small object, such as a leaf, with the intention of exhausting the details to be assimilated. [*Test*]

Further, the process of economisation evidently applies to observation as well as to re-collection Catching sight of a blue helmet, I say to myself without further troubling This is a policeman Seeing a hand, I forthwith recognise, without further analysis, that it belongs to an acquaintance of mine. Hence, to speak quite generally, we see and observe no more than we need. We assume an airy attitude towards all that is indifferent [*How far do you agree?*]

Looking at matters in this light, we are driven to an additional conclusion we mainly see and observe what we have seen and observed before, and infinitely little beyond (sec. 118) We are not walking cameras which impartially photograph everything within view; we rather observe the little we have observed in the past, ignoring the vast mass which has not been pointed out to us or to which we have not specially attended. Attention is an antiquarian and strongly conservative

79.—MEMORY CONTENTS DWINDLE.

Observation procures little, and of that little, most is forgotten (sec. 114). When we come to what is re-developed, we encounter but a sorry remnant, an ocean shrivelled into a pond. The number of incidents has shrunk alarmingly, and the particulars of these incidents have almost gone. Seven hundred re-developed details of a seven months' journey form a poor sample indeed of our power of retention, and a hundred details, embracing the first nine years of our life, present even a more meagre exhibition. Yet thinking of yesterday's events, I can nearly double in details the journey referred to; and taking an actual day with its events photographed, the figure may be multiplied a hundred-fold (sec. 114). As we are not now discussing the problem of memory, we need only note that we cannot expect images to be photographic copies of objects and events (sec. 117).

80.—EVERY SECONDARY UNIT OR IDEA REPRESENTS A SET OF ACTIVITIES, AND CANNOT BE STORED.

I wondered whether I had previously seen a particular face, and a face occurred to the memory. That face, as we have learnt, did not bear of necessity an exact resemblance to reality. Is that re-developed view, we may now ask, an element, a simple something? The complexity of our organ of sight is well known to the student; but it is only latter-day physiology which has conclusively shown that the complexity continues right up to the brain centres. The nervous system is hence not comparable with a telegraphic net work; it must rather be thought of as a vast factory. The simple ether waves beat against the eyes, and that event is followed by a series of complex transformations. Though in the primary process, the last step depends on the first, yet when the change is once initiated by the latter, the former may be produced independently by a central stimulus. Hence visual re-collection, or what corresponds to it physiologically, is independent of the sense apparatus; for, in strictness, its material is not sense produced. On the physiological plane, therefore, the re-collected face is the embodiment of a complicated set of activities.

Accepting this point of view we are able to deal with one or two matters of importance. The absence of detail in the re-collected face, for instance, is not an accident which may be repaired by closer attention. The face we see is a poor one; and any other face would be a different one. We are not concerned with something which remains ever the same whether we look or not, or whether we are far removed from it or near. There exists no face apart from the one we see at any time. Hence any change in features is a change in face; or, physiologically speaking, the acts expressing the two sights are separate and different acts.

We cannot, therefore, speak of images as presentations, as things posing before us like a model before an artist. An image is like the painter's Madonna or the sculptor's Diana: it is the result of delicate workmanship.

The fading Madonna is not the same as was the newly painted one; and the faded Madonna shows little resemblance to the original. For the same reason every image, though it be easily executed, is, strictly speaking, an art-product, and every stateable change is a real change. Hence images are not presented to us, except by licence of speech, and consequently the doctrine that images are presentations appears unfounded. (Sec. 177.)

Such being the case, we cannot agree that images may retire and persist in a faint form, for such images, continue as they may, would be new images as would be the Madonna if colours and outlines were blurred. Similarly we cannot give our adhesion to the opinion that everything once observed persists, screened as it were by the few images present at any time. A screened image is a different thing from an unscreened one and appeals differently to us, and hence the continuous existence of one would in no way explain the continuous existence or re-development of the other. Furthermore, the process of economisation, together with the corrosive effects of oblivion, produce incessant changes and transformations which tell wholly against a secondary shelf whereon all images are ranged and preserved in a faultless condition. [*Note the effect of economisation and oblivion.*] Thus Wundt (*Psychologie*, 1893, ii, p. 460) rightly reasons against Herbart that every idea is composed of manifold elements, and represents on each occasion a new process. Similarly Hodgson (*Metaphysic of Experience*, 1898, i, p. 128) expresses himself emphatically: "Consciousness is not given to us in isolated atoms. Its simplest portion is a complex state, its smallest portion is a process."

The doctrine of presentations which is here criticised is in England held specially by Ward and Stout. Ward, in addition, favours "the perfectly conceivable hypothesis of infinitesimal presentations so faint as to elude discrimination" (*Psychology*, 1886, p. 48, col. 2). The objections urged against James Mill's swift thinking apply here. As we can follow the brightness of the noon day fading into night, so should we be able to trace the sinking, simplification or diffusion of presentations. The distance from measurable to infinitesimal ought to be describable by more than a blank. In experimenting I can detect no such process in calling up or dismissing ideas.

Brentano, who is followed by Stout, distinguishes sharply between the *act* of presentation and the *content* of presentation, *e.g.*, between hearing and what is heard. To me this distinction appears untenable, as would be the suggestion that one could distinguish between the act of a stone falling and the stone which is falling. The act of falling only means that we see a stone and other objects, the stone occupying different positions from moment to moment. And so the act of hearing can only mean that we think of the thing heard in relation to what is connected with it, *there being in both cases nothing but concrete events or contents of presentation.* An act of presentation, in short, is something presented. It is a misfortune for psychology that men with anti-scientific interests like Brentano, profess to be psychologists, and champion opinions on the subject that have no real psychological value. Another distinction which Brentano makes is that between *content* of presentation and *object* of presentation, and here also Stout unhappily follows. It is true that ordinarily we only have incomplete or unexhausted ideas; but these unexhausted ideas are still the objects, or, if they are not, then we are landed in the position that we know nothing whatever of objects, the word having the meaning of an undetermined X. Either the world as seen at any time is the world or part of it, or the world is absolutely unknown to us. An object of presentation, like an act of presentation, must be a presentation, an event, a system of elements,—for an inferred exhausted compound is no more—or else it is nothing at all.' (Sec. 198.)

One cannot help feeling that the only motive for these theories is the desire to find room for a soul that stands and acts apart from the world, and to which the world is presented. How different is the whole-hearted piety of men like Hartley, Brown and Abercrombie, who keep second thoughts out of their psychology! A clear exposition of Brentano's doctrine is to be found in Twardowsky, *Inhalt und Gegenstand der Vorstellungen*, 1894.

We may here refer again to Herbart. Being of a philosophic turn of mind, conversant with the theory of music and fascinated by the simplicity of the first principles of physics, he determined upon a mind scheme closely corresponding to the matter scheme he was acquainted with (*Psychologie*, 1824, i, p. 325). In physics we have only matter and motion, hence Herbart allows only for ideas and their movements. "Instead of gravitation . . . we have the natural and constant striving upward of all ideas" (*ibid*, p. 326). "Psychology," he also says, "has some resemblance to physiology: as the latter constructs the body out of fibres, so the former constructs the mind out of series of presentations" (*ibid*, i, p. 192). Herbart was well acquainted with the association theory (*ibid*, i, p. 193), and only complained that Associationists did not mechanically explain the process of association. Every idea, according to him, strains to enter and to remain in consciousness; but succeeds only passingly on account of its brother ideas which are similarly placed. Hence "as far as the movement of ideas is concerned, we distinguish those which are sinking, those which are freely rising, those which are freely standing, and those which are reproduced" (*Encyclopædie*, 1830, p. 308). For this reason ideas are never forgotten, never out of consciousness (*Lehrbuch*, p. 18) and never resting; but, at worst, blurred, repressed and eager to come forward (*Psychologie*, i, p. 340). Nor does an idea disdain to lend or receive help, for it "always tends to bring with it that which is related to it by any kind of assimilations or complications" (*ibid*, i, p. 433). In this way single ideas are supported by and fit into presentational masses, such as are understood by words like "government" or "church" (*ibid*, ii, p. 192). In short, the struggle between the ideas forms the mathematically measurable play of thought. Here is a simple theory, meant to be all-embracing; but without any positive value. All is fiction, from beginning to end. The floating superstitions of the street, except as regards faculties or powers, are baptised with awe-inspiring names. What are masses of ideas from a scientific point of view? How are we to weigh these masses? And if these masses are indeterminable, or not yet determined, what becomes of psychology? Hence, as we expected, Herbart throws no perceptible light on any of the problems raised in this book. Had he come at the mature stage instead of at the birth of psychology, his comprehensive mind might have worked wonders. As it is, his failure is another warning to those who ignore the study of facts.

81.—Sense Impressions are One with Images.

If our conception of the complex origin of an image be correct, an important conclusion follows. We have thus far spoken of images as if they were strictly distinguishable from so-called sense impressions; but this difference seems gratuitously assumed. The so-called image and the so-called sense-impression, on the physiological plane, are both primarily traceable to certain central changes, the stimulation of which centres must be indifferent to us in this place. It follows that what is observed and what is imagined are of one kind and are one thing. Hence the word image or sensation, apart from convenience, is applicable to every fact without exception, and, therefore, to the material of observation, and hence, too, all we have said as holding of secondary units holds also of primary ones.

An additional consideration may strengthen the above deduction. We have insisted that, roughly speaking, we only see what we have seen before. If that be so, memory plays a crucial part in observation. We observe what we observe, because of memory, previous thought formations leading us as if we were blind. Memory and observation are, therefore, inextricably blended. In reading, for instance, we partly see and partly redevelop the words, while the very seeing of the letters depends on familiarity. (Sec. 107.)

What is observed and what is re-membered are, for the above reason, distinguished by secondary characteristics alone. That which we speak of as re-membered, usually displays fewer details, possesses no rich setting, offers no continuous environment for analysis as does what is observed, and may be generally dismissed at will. For instance, I re-member a poster on a hoarding. The imaged poster appears tolerably real, though close scrutiny shows how soon we have exhausted the imaged details; but against this must be set the fact that the immediate environment of the poster, *i.e.*, other posters, is very faint, while the remoter environment, *i.e.*, houses, etc., is untraceable (sec. 124). Certain difficulties, which do not appertain to our immediate inquiry, compel us, however, to seek for a more fundamental distinction, and that we find in the schematic relation of primary and secondary systems. In this way we define the nature of reality, memory, imagination and dream-life, by establishing their positions in the plan of things (sec. 124).

82.—MOVEMENT AND THOUGHT.

If our needs and the machinery for satisfying them, are (what is called), physiologically determined, and if images can best be understood when physiologically considered, then the realm of images must be further extended. Our movements are the result of complex processes, as are our images, and the facts of economisation, memory and attention apply equally to thought and movement. The process, in both cases, is also complex as well as adapted towards an end. We may, therefore, legitimately speak of movements constituting intelligent acts and being units, since units are but the particles of intelligent processes. For similar reasons, the lower activities of the stomach, heart, liver, etc., must, in the last resort, be regarded as of the same nature as those activities which we have hitherto taken into consideration. The apparent breach between matter and mind, which makes such a conclusion irrational, must be thought of as apparent only. (Ch. 8.)

83.—UNITS AND TRAINS OF UNITS.

Our reasoning has thus far proceeded on the principle of *one word, one idea*. We must, however, here ask ourselves whether such a principle will survive the hardships of an examination, or whether the word "idea" is not merely a term of convenience. Men have talked of trains of units or ideas as if they were dealing with trains consisting of securely-coupled railway carriages; and in this light a train of thought would be constituted by so many separate units or ideas. We have spoken of a re-collected face as representing one unit, and we have also referred to incidents as represented by single units. Accordingly, terms such as London, England or Europe may be considered as single units, each of which, as we know, is not, at any time, a mass of details, but suggests some relevant aspect. No more is thought of generally than the situation necessitates. [*Recollect objects as a whole, then portions of them.*]

Stout contends "(1) that any reproduction which can be called an idea, must have sufficient independence to be capable of forming a distinct link in a train of thought; (2) that it must be the thought of an object, such as a thing, quality, relation, or event, and not a mere crude sensation, however faint; (3) that just because an idea differs from an actual perception, ideal reproduction is always of a partial and modified character" (*Manual*, 1898, p. 94).

84.—The Nature of Language.

The nature of reasoned language introduces us to a fresh problem of the same character. It might be thought that since each word represents a unit or idea, a sentence of ten words, *e.g.*, "The pen with which I write is an obedient servant," is a symbol for ten units strung together like so many beads. The falsity of such a view is obvious, and as language is the chief instrument of communicated thought, I will here analyse those lingual aspects which belong to our subject.

In language are embodied the distinctions which have been discovered by the human race. While objects, *i.e.*, systems regarded as exhausted, are individual and concrete, language represents, in a less complicated form, a system of signs to designate those objects and their relations. Thus a certain peculiarity strikes us, and we speak of a big face, a big man or a big country. In a similar strain we indicate relations of time, number, quality, connection, comparison, interests, etc. Now it is evident that instead of using two words, such as big man, we can employ the one word giant, and yet the latter term implies but one unit. If we turn to the data, our surmise receives confirmation. Economisation has made us drop the separate emphasis, and yielded a single unit in two words, a unit which can be well expressed by one word. Hence terms like tent, hut, cottage, house, mansion, palace, castle, might each be expressed by more than one word. We conclude, then, that while adjectives are sometimes employed to point to a certain property, they, together with the noun they qualify, form frequently a solitary unit or idea. What, again, is true of adjectives, equally holds of adverbs, and of speech generally.

In compound words the above contention is easily verified. In "blackbird" or "black-board," we do not think of a bird or a board which is black; but we have a solitary object in view. So, when we think of Paternoster-Row, or of the Prince of Orange, or of Trinity Church, we are evidently not reminded of a paternoster, an orange or a trinity. [*What do such* *names suggest to you?*] By the force of economisation these compounds have become names for single objects, the more primitive meaning of the separate words being neglected. Thus we figuratively speak of a queen having ascended the throne at a certain date, when we neither think of the act of ascending, nor of a throne. Similarly we refer to some one as being the "lion" of the London season, when no image of a lion develops. So even with separate words. "Get away," "get money," "get on," are phrases in which the meaning of "get" differs fundamentally; for we could not paraphrase them, "obtain away," "obtain money," "obtain on." And, finally, the complexity of the object gives its corresponding sign a complex character.

The significance of words is not determined by a rigid standard, and hence the interpretation of language must follow the varied meaning which underlies words. A sentence can thus be thought of as a unit or idea where the totality of words counts for one word, or else as a set of words, the meaning of each of which is counted separately. Especially with the help of the process of economisation do we now understand that word-sentences are something different from haphazard sets of words. It has been said that a melody is more than the separate sounds of which it is composed. This is far truer of words, for in the word-sentence the meaning of each separate word may be wholly lost. It is as if the separate sounds were frequently immaterial to the melody. Leaving aside the dynamic aspect, we understand now the inner depths of language as employed by the adult. Whole sentences and paragraphs express but single units. When I, therefore, say "The pen with which I write is an obedient servant," there is no fastening together of ten separate units into a train. We have rather before us an organic complex which defies mechanical interpretation. In some language one word might do the work of the ten. (Sec. 215.)

85.—WHAT IS A SECONDARY UNIT OR AN IDEA?

Take the observational attitude. My eyes sweep carelessly along the façade of some imaged mansion. Is this total act, lasting some time, to be thought of as one unit or as a train of units? And if thought of as a train, must not, for the same reason, a single imaged face be equally regarded as a train of units or ideas? And if so, where is the line to be drawn? Now let us first be clear as to the nature of this total act. It consisted of no more than appeared on the surface. I did not necessarily think implicitly or explicitly, of the whole history of architecture, of all buildings I had seen, and all that was related to mansions. I did not think of all that the house might reveal to the five senses, and of the reactions which such revelations might bring about. There were colour, shape, depth, obvious relations of parts and a few other reactions. This normal simplicity, so different from what an exhaustive analysis of possible relations would yield, must ever be kept in view. Yet even this residue must be considered as a complex. The house, as a system of lines, is only seen, to begin with, because we have seen other houses. The various spatial and other relations, however readily discerned, imply special processes. Thus, when we push the inquiry further, the very fact of sight argues a certain complexity (sec. 182). Moreover, if we extend our inquiry to the other senses, an additional problem arises. In the final analysis, it may be surmised, we have only to deal with a nervous shock or a simplified touch system, out of which, by differentiation, the mass of disparate systems is evolved (sec. 189). Every individual act, then, is composed of the same minimal acts, of atoms, we might say. If the colour green, for instance, is seen in three consecutively re-membered pictures, we probably have not three greens, but the same kind of act three times repeated. In this sense, the notion of storing images becomes unintelligible. There is increased readiness to perform certain processes which represent certain pictures, and that is the Alpha and Omega of psychology on the question of memory, so far as it concerns us at present. (Sec. 80.)

Strictly speaking, then, *we should speak of a process of combination, and not of units and trains of units, nor of perceptions and trains of perceptions.* So-called units are all more or less fluid complexes, and hence not easily distinguishable. So called simple units or ideas resemble, on close inspection, so-called trains of thought, and it is as reasonable to think of storing the latter as the former. The developing of a unit is like the painting of a picture, and a second picture is developed by utilising the material of the first, as the same cards are employed over and over again in building card-houses. Since also the present and the past, the near and the far, are so bewilderingly interwoven, we must think of the forming of units as an organised process, dependent on inherited structure and adaptability.

"The localising and the objectifying of sensation, make up together what we commonly understand by perception" (Sully, *Human Mind*, 1892, i, p. 207). Sully's whole account in this respect is inorganic. As a rule we no more objectify or localise what is sensed, than we class it among what strikes us as useful, good, beautiful, pleasant, pertinent or what not. In each instance the relevant minimum suffices. As we shall see, when, on smelling violets, I say "I smell violets," I am only dealing with an additional datum which has no thinghood in the ordinary sense about it. So when I assert "Here is an orange," there is no need for scent, taste, hardness, pleasantness, or other associations, to hide themselves behind the skirts of that word. (Sec. 107.)

86.—SUMMARY.

The conclusions we have thus far reached are as follows. There is a process of combination which constitutes intelligent or organised acts and systems. That process is retarded by the incompleteness of both observation and retentiveness, and is vastly simplified by the method of economisation. Observation, memory and organised action, simple and compounded systems, separate words and word-sentences, all imply fictitious antitheses. We can hence understand how long strings of relevant sentences are quickly uttered without the words having any apparent sensory or other accompaniment.

87.—THE DYNAMICS OF OUR SUBJECT.

Though we have concluded that movement, or process, is implied in all sensations and images, or integrals, yet for practical purposes it will be as well to assume here that there are separate units or separated processes. Such a division permits us to glance at the order in which units follow one another, and this undertaking will be the easier because the reader possesses now for his guidance definite notions as to the nature of units or ideas, notions which should enable him to concentrate his attention on the *current* of thought rather than on the *particles* of which it is composed. It only natural that after having indicated the statics of thought—thought at rest, we should proceed to investigate its dynamics—thought in motion.

88.—THE COMPOSITION OF SECONDARY SYSTEMS.

"Have I seen that face before?" was the question I put to myself, and forthwith, as we saw, the face referred to re-developed. Premising that we are only concerned in this place with what succeeds, rather than with the how of that succession, it will be readily granted that a face identical with the one present was re-produced. We may now vary our question, so as to learn the changing aspects of the problem of succession. I say to myself that I wish to see a somewhat similar face, a similar one, and one extremely like it. So, still experimenting, I try to re-produce some other face, then a dissimilar one, one recently and one not recently thought of, one that is good, beautiful or clever, one that I have seen or thought of in conjunction with it, one gained by re-casting the re-produced features, by deliberate decomposition of details or by wear of the features; and lastly, I try to think of something much unlike a face. [*Find, if possible, other cases.*] I succeed in each of the tasks referred to. But let us illustrate some of the above. I look at a person before me, and the image of some one I have not met for some years takes shape. I look once more, and I think of some one whom I occasionally see. I desire to re-produce something recent, and my desire is fulfilled at once, though only a desire existed. So also I attempt to think of something that happened long ago, and an incident covered with the mould of time, is the consequence. Thus, again, I endeavour to call up something unlike the image I am fixing, and after a short struggle I am rewarded. In the same way what is important, what is interesting, what is good, what is beautiful, and the like, are re-produced at pleasure. In truth, only what is utterly unlike entails difficulties. [*Test experimentally every step in this paragraph.*]

Let me now give a hint, for I cannot do more, of the curious arches which span the chasm between units. If we intend to act at haphazard or arbitrarily, we shall observe that at some point of the seen body a skin sensation develops, and in the customary fashion we move, say, that arm or finger where the sensation is felt. If we intend to continue arbitrary movements, then the process above described repeats itself, unusual movements being rare. There is here, therefore, an intelli gible sequence: we are ready to act; we are waiting for a sign; accident, always to be relied on in this connection, produces what we want, and we repeat some action familiar to that part, activity being readily initiated in the chosen direction. [*Test experimentally.*] In arbitrary utterance a chance tendency is likewise exploited; words come to us with the same initial letter, or with the initial letter next in order; and the syllables exhibit a certain calculable length and character. (Sec. 152.) [*Test experimentally.*]

Relations, similar to those between words or between primary systems, may be observed among images. I look at a person, and my eye happens to rest on the mourning band round his hat. This indicates the point of departure. As I centre the attention on the band, and otherwise ignore the person, the band develops around it another familiar environment in the form of an old friend whom I had not seen for some years, and who wore such a mourning band. Or, again, my attention is arrested by his moustache, and an acquaintance from the country who has such a moustache develops. If we assume that an image represents a process, then it is not difficult to admit that any section of the process, *when stimulated*, may develop in different familiar directions. [*Test the preceding.*] Reproduction of what is identical or similar is here apparently explained: a given feature is emphasised, abstracted and permitted to evolve around itself a new environment.

Contiguity, or proximity in space and time, forms no exception to the above. While thinking of a face, we may, for instance, explore the secondary visual field of which that face forms a part. [*Repeat repeatedly.*] In this manner the secondary process is developed in certain directions, ending in the re-development of what is contiguous, or rather continuous.[*] Similarly, by re-distributing attention, by sensitising a certain brain area, relations other than spatial are developed, and these prove a stepping stone to further familiar developments along the lines of time and contents. Just as an assumed angry expression suggests anger, so active secondary vision and audition play their parts in restimulating in a new order or in an old, what is visual or audile. In fact, in contiguity as in similarity, the emerging contiguous image implies that something else is being ignored, as in secondarily or otherwise exploring a room. Thus change in the line of activity, assimilation in a new direction, or movement of the attention, marks both contiguity and similarity. In both instances only the line between the new and the old represents both the new and the old.

The problem of re-producing what is recent is on a somewhat different plane, for here there is no connected process, in the ordinary sense. The stretched string of a violin, when sharply twanged, recoils and visibly vibrates for some time, and so a brain area, when excited, remains for a period in a highly unstable condition. Under these circumstances, memory, as we know from the ease with which we re-develop recent events, is almost as trustworthy and complete as observation, while the momentum is such that unless there is a strong bent in another direction, the recent will again and again appear before the bar of attention, the nascent becoming real, the possible process becoming an actual one. Hence it is common for the recent to come forward uninvited, and to connect itself readily with much that is passing. It is also this high instability that supports and carries along any and every continuous process of thought. Passivity of a kind is all that is required in re-membering the recent. (Sec. 110a.) [*Re-member what is recent*]

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[*] Mervoyer (*Sur l'Association des Idées*, 1864) speaks of "the law of contiguity or continuity," p. 52.

89.—SECONDARY COMPLICATIONS

Experiments along the line just spoken of incidentally unmask a known fact of the utmost importance psychologically. A few hours ago I looked at a striking pictorial post card. Desiring to re-produce something which recently took place, that post-card occurs to me. Later on, I repeat the process of wishing to re-develop something recent, and the post card, for a new reason, has once more returned. The fact is that recency plus post-card becomes one complex, and that the re-collection of the former most easily developed into the latter. We obtain from this the principle of secondary complications, *if we agree to give the name of primary complications to those images and sensations which are connected in observation*, re-membering that there is no proper division between primary and secondary facts. As will be seen at once, this principle is of commanding influence. Since percepts and ideas are ceaselessly thought of in new relations, secondary complications are being continually shaped and strengthened. So sweeping is this factor that it is the principal means of forming scattered sensations and images into an organic network. Without this constant interweaving, the free play of thought would be impossible.

Another instance well illustrates the principle we have been contending for. While viewing a face, I try to think of something unlike it, and a basket occurs to me.* When this has once occurred, thinking of what is unlike becomes closely related to the notion of a basket, and the one being re-produced the other develops forthwith. For this reason, I have, in experimenting, to dismiss dozens of these spurious unlikenesses, and on every occasion we must allow for stereotyped complications which have grown out of the experiments themselves. [*Try and re-collect what is unlike.*]

Association by contrast, as far as traceable, is explained by the process referred to above. Contrasts, being interesting, are sometimes noted—though in the aggregate not often—and hence secondary complications are originated with the result that thinking of the one extreme, *or any extreme*, readily develops, because it involves, the other. Hence the multitude of hackneyed contrasts—giant-dwarf, high-low, good-bad, bitter-sweet, etc.—must not be regarded as developing one another in virtue of the contrast; but rather as closely connected secondary complications, such as sailor-soldier, life-strife, lover-sweetheart, father-child. [*Test experimentally.*]

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* It is superfluous to say that mediate association was strongly guarded against as well association through words or through after-images (James, *Psychology*, 1890, ii, p. 84). Ultimately, perhaps, we shall find the explanation in either recency, or in some modification of the described process which leads to the re-production of what is identical, similar or contiguous. Difficult as the task may be, the unlike can seemingly be thought of.

Can I think of what is old, of what is sweet, of what is good, of what is indifferent, of what is limp, of what is important, of what I hate? [*Can you?*] I can, and that in virtue of the fact that the words or the stimulating units have formerly appeared in connection with what will follow our question. Unless we assume some such solution, it becomes difficult to describe what is, on the face of it, so unrelated. Why should the word "old" be followed by the vision of an aged beggar? or the word "sweet" by the sight of a piece of preserved ginger? For no other reason ordinarily, I contend, but because the units of "old" and "beggar" have occurred in some form or relation previously, and because they constitute, therefore, a secondary complication. Thus the easy flow of the stream of thought is due to the myriads of secondary connections which have been constructed. [*Experimentally repeat the preceding.*]

Primary and secondary complications are often no sooner formed than they are dissolved. To be firmly fixed, they must be repeatedly re-collected. Again, as express purposes do not generally connect complications, and as a certain looseness and independence is valuable for effective thinking, we find that one image is by no means always followed by one and the same connected image. So also the nature of secondary complications makes it clear that the relative age of an image does not, where normal thought is concerned, enter into the question. What happened twenty years ago—provided it has been re-developed frequently since—is as likely to emerge as what happened ten minutes ago.

90.—DEVELOPMENT, EXCITEMENT AND SECONDARY COMPLICATIONS.

We have thus far dealt with the time relations of two particles of thought, and we have found it essential to assume that the bulk of units or ideas are but expressions of a few processes, and that the units or ideas do not exist apart from these processes. Since, for instance, the mourning band of the one man is, psychologically, the same mourning band which is worn by another, the process of development, or the movement of the attention, may lead to the re-development of either of the two men. Thus the mourning band, as such, is but a link and not the reason of the re-production of the other man. Leaving aside the question of recency and, possibly, of unlikeness, and there remains but one fundamental method, *i.e.*, that of development of a process along certain lines of space, time and content—or content simply—by which any two or more units may be connected.* The only subsidiary principle of a far-reaching nature which we have discovered—the fusion of ideas and percepts with ideas or with percepts—is the existence of secondary complications, making a living whole out of individual unconnected parts. It must be confessed, however, that not until the neural processes, which best express thought, are laid bare by the physiologist, shall we have a truly rounded and scientific explanation of the nature of thought. The objection which will be raised on account of the incommensurability of what is mental and material, may be answered in two ways. First, we have a right to press for a solution of a problem in whatever direction we think it necessary. Secondly, the antithesis between matter and mind, as we have already stated, and as we shall see in ch. 8, may prove to be superficial and transitory.

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* Wundt (*Psychologie*, 1893, ii, pp. 466-75) similarly reduces association to sameness and contiguity of process.

We have seen that any thought following another in a thought complex is *always* continuous with some portion of that thought complex, except in the case of neural excitement. Having ascertained the fact of invariable continuity, we may analyse its various aspects and class them, say, as that which is contiguous and that which is similar. Such a classification, is, however, a descriptive process which yields no insight into what is fundamental. Let us consider the character of contiguity. With eyes shut, I take a detailed continuous view of the four walls of a certain well known room. While in this example there is continual fading at one end of the picture, as in ordinary vision, there is continual development at the other end, as in a dioramic scene. Here we have a certain sense complex which is connected with a developing sense complex at one point alone, precisely as in ordinary vision. That is to say, what is at the fading end of the picture is in no way contiguous with anything but what immediately adjoins it, and what emerges does so, as in ordinary vision, solely owing to the inward sweep of the eye. When development assumes the form just referred to, we speak of association by contiguity Consider now a case of similarity. I look at a person and my attention accidentally alights upon the black band around his hat. Everything now fades except the band, and around that a new human figure develops. When this happens, men say that we have a case of association by similarity, one man suggesting the other because of the likeness between them. As a matter of fact, the two examples exhibit precisely the same features, *i.e.*, while one portion fades another develops. In strictness, then, it is wisest to abandon the older artificial classification into what is contiguous and what is similar, and simply recognise the fact of continuity. This course is the more reasonable, since, on the old lines, we are bound to admit a third class of association—association by identity. For instance, I may repeat some new sound. Here the second sound is not connected by contiguity with the first, since it has not been repeated before, nor is it connected by similarity, for the two sounds are of an identical character. We may, indeed, say that the desire to repeat is here the ground for the repetition; but, then, we may also say that the desire to obtain what is similar or contiguous is the ground for such similarity and contiguity appearing. However, we can proceed further: when the demand, say, is made, "Recall X. and some one like him," we have similarity; but what happens when we say "Recall X., Y., Z.," or "Recall the members of a Committee." In the second case Y. is not necessarily connected with X. by either contiguity, similarity or identity, X. being unproductive of associations, and Y. being directly connected with the desire to recall a member of its class.

If the above analysis be correct, we can readily see that no association or suggestion of any kind explains the flow of thought. *B* in following *A*, must be, we grant, in some portion continuous with the latter; but from this it by no means follows that *B* succeeds *A* of necessity. A brick, when thrown at an object ten yards away from where it lay, must pass through a continuous space of ten yards; but who would, therefore, assert that the continuity of movement explains the fact of movement and its direction? So with the flow of thought, which is only fully explained by the gradually developed process of the satisfaction of needs or functional readjustment. Omit the existence of needs, and no thought would ever be followed by another; what is more, every thought is but the expression of a need or of functional readjustment.

Reasoning along Brown's lines, one might plausibly contend that what we have called *desires* may be regarded as a sufficient explanation of the flow of thought. Thus the feeling of hunger may be said to explain the whole process which ends in stilling the hunger. Great as is the temptation to adopt this method of explanation, we find that the data are unfavourable to such an attempt. Owing to the nature of organised reactions, the *desires* have no qualitative and quantitative characteristics which can be employed as safe guides. They also give us no hint as to why they should be followed by certain particular ideational processes. On the other hand, in the bodily organism as evolved by natural selection, we have a complex system where, in theory as yet, it is true, we may follow the rise, development and satisfaction of needs to the minutest detail. We can understand, for instance, how a certain state of the stomach produces a series of changes which end in another state of that stomach.

Most generally stated, we may, therefore, say that *what is to follow in thought must be continuous at some point with some parts of that which precedes it, while* THE FACT OF ITS FOLLOWING IS SOLELY THE RESULT OF THE EXISTENCE OF A NEED WHICH PRESSES FOR SATISFACTION.*

90a.—Associationism.

It is advisable to give here a summary of the associationist doctrine, supplementary to the remarks made in the Introduction. We have seen that Hume had already spoken of the laws of association as ultimate facts, and we have learnt that Hamilton held the same view. If then we pass to the other associationists, such as Brown, the two Mills, Bain, Spencer and Sully, we find the same belief in the finality of the process of association. In fact, this finality, within limits, is accepted by almost all psychologists of every school. Nevertheless, one drawback to complete intellectual satisfaction has been universally admitted. Why, it is asked, are there *three* laws of association? Why can they not be reduced to one? Accordingly an attempt at simplification has been made. Brown (*Lectures*, 1824, ii, p. 205) holds that "all suggestion . . . may . . . be found to depend on prior co-existence, or at least on such immediate proximity as is itself, very probably, a modification of co-existence." Beneke (*Lehrbuch*, 1845, p. 88) says: "Similarity is analysable into sameness and difference, the difference being given simultaneously with the sameness." Similarly Hamilton, Hodgson and Bradley, in the passages referred to in the Introduction. So Lipps (*Grundtatsachen*, 1883, ch. 6), following his master Beneke, reduces contrast to similarity, similarity to contiguity and inseparable connection, and contiguity to simultaneity. A similar view is expressed by James (*Psychology*, 1890, i, p. 578). And lastly, according to Sully (*Human Mind*, 1892, i, p. 335), we assimilate in revival by similarity that portion which is common to both objects, the remaining part being re-produced by contiguity. In this manner the *three* laws of association may be said to have been reduced to one law, to immediate co-existence or, as some think, to immediate succession. Yet one step more remained to be taken. As Brown argued, and after him Bradley, if the association depends on the recognition of similarity or contiguity, then the object is already recalled when it is not yet associated. Hence Brown preferred the word suggestion, and reasoned that all one could say was that such a thing suggested such another thing. Rightly enough, therefore, Sully (*Human Mind*, i, p. 330) speaks of the association or suggestion of similars rather than of association or suggestion by similarity. This last stroke makes the hypothesis we are discussing wholly unexceptionable as regards statement.

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* Stout draws fundamental distinctions to which, as our text shows, we cannot agree. In his *Psychology*, 1896, i, p. 123, he says that a man "never regards the suggestion of one idea by another as his own act. So far as the sequence of presentations is determined by association, it is determined *for* him and not *by* him." Robertson, again, says: "There is one kind of experience that is governed by association entirely, and that is the trains of bare representation termed Reverie" (*Psychology*, 1896, p. 164).

In strict theory we know now what to expect. If I see a face, it will suggest what has been associated with it along the lines of contiguity, resemblance and contrast. Thus the face suggested will suggest in its turn the totality of connected systems forwards and backwards, while, by implication, the face will suggest other faces, its colour other colours, its beauty the whole question of æsthetics, its expression the whole department of ethics, and so on. This is usually admitted, as the laws formulated by Bain show (sec. 1). Nor does Bain stand by himself. Already Brown (*Lectures*, 1824, ii, p. 357) had quoted, after Lord Kames, a long speech of the Hostess in Henry IV. to make clear that uncultured minds tend to re-produce things in tedious fulness, as illustrating the law of contiguity. For similar purposes James (*Psychology*, 1890, i, p. 571) quotes a similar type of speech from one of Miss Austen's works to illustrate what he calls the law of impartial redintegration. Thus Spencer (*Psychology*, 1890, i, p. 461) seems to associate himself with those who believe in the tendency for contiguous reinstatement. Sully, again, puts the matter unambiguously: "The sight of a familiar room, or the sound of a familiar name, tends to call up a number of images" (*Human Mind*, 1892, i, p. 339). So Stout, *Manual*, 1899: "If *B* has been perceived or thought of together with *A* or immediately after *A*, then, on a future occasion, the perception or idea of *A* will tend to call up the idea of *B*" (p. 420). And, "in proportion as the control of a dominant interest is weak and intermittent, the tendency is exactly to repeat the original order without omissions and inclusive of interruptions" (*ibid*, p. 423). Or, again, "In any given stage of a train of thought the next step is partly determined by the controlling influence of the central idea of the topic with which the whole series is concerned, and partly by the special idea which has last emerged. In so far as it is determined by the latter, the principle of association is operative; in so far as it is determined by the central idea . . . noetic synthesis is operative . . . It is mere association, for instance, which would lead a man in a conversation on peace and war to begin to talk about Peace the murderer" (*Psychology*, 1896, ii, p. 3). So Lotze, *Microcosmus*, 1885, i, p. 216: "All reproduction rests on the impossibility of the resuscitated impression appearing alone, without trying to bring with it the whole of which it previously formed a part, and of that whole specially the other single part to which it was most closely attached." Similarly, Taine, *On Intelligence*, 1871, p. 88: "When the image of the form we have perceived tends to revive, it draws with it the images of its several accompaniments." And so Stricker, *Das Bewusstsein*, 1879, p. 41: "As I am thinking of the word 'horse,' so the many pictures of the horses which I have seen, tend to appear." Thus the presumption of full reinstatement is not only admitted, but explicitly exemplified. As regards the illustrations given by the authors quoted, they are, for many reasons, of little value. In the first place, very few uncultured persons *tend* to obey the law of impartial redintegration; secondly, in all the examples given there is over-elaboration, but otherwise strict consistency or "noetic synthesis"; and, thirdly, the kind of impartiality demanded by the theory, is utterly absent even from the mind of the maddest of madmen. What usually happens is that the overwhelming majority of the details are forgotten; that the overwhelming majority of the remaing details are neglected; and that the overwhelming majority of similarities remain unnoticed. Sully, indeed, tells us that since the numerous suggested images "cannot be all revived together, there results a conflict of suggestive tendencies" (*Human Mind*, 1892, i, p. 339); but research offers us no such spectacle. Thus the letter *a* instead of suggesting to us the totality of our knowledge, may fail to suggest anything. [*Experiment.*] It is rather with cultured and with uncultured, with child and with man, as Stout (*Manual*, 1898, p. 42) puts it: "In recalling a train of events we usually pass from one salient occurrence to another, leaving out the relatively unimportant details which actually intervened between them." Or to quote an ideal case, most true to average life: "The ploughman's active day, is partly summed up in the furrowed field that is pictured in his mind in his evening retrospect" (Bain, *Senses and Intellect*, 1894, p. 476). This last example, by its utter unlikeness to what the theory demands, finally disposes of the simple solution of succession with which the laws of association were supposed to equip us. What is more, as the suspected tendency never, under any circumstances, is observable in fact, we have good reason to question its existence. It is true that what comes up in idea is, in some way, usually related by contiguity or similarity to what had preceded it; but the fact that such similars are not mere similars, but relevant ones, still leaves Paulhan's interpretation open that "it is not resemblance, it is convenience which is the directing cause, the why of the association" (*L'Activité Mentale*, 1889, p. 408).

The glaring discrepancy between data and theory did not, of course, escape detection, and a number of secondary laws of suggestion were formulated by Brown (*Lectures*, 1824, ii, pp. 253-65), who urged that some units or ideas were at a greater disadvantage than others. These are his secondary principles: Continuance, or the length of time that an idea has been present at a stretch; liveliness, or the forcible impression which an idea has made upon us; frequency; recency, or the shortness of time which has elapsed since the idea was last to the fore; purity, or the clearness due to an idea having co-existed less with other feelings; constitution, or original constitution; temporary emotion, or the mood we are in; bodily state; and prior habits. Similarly Hodgson (*Metaphysic*, 1898, iii, p. 113) says: "Strength of original impression, number of connections with other impressions, and the increase by habit either of a particular impression or of any of its connections with others, seem thus to be the chief circumstances favourable to the redintegration of any given idea or imagery, under the two main laws of similarity and continuity of brain processes." So, to illustrate the influence of emotions which are common to many events, Brown says: "When, for example, the whiteness of untrodden snow brings to our mind the innocence of an unpolluted heart,—or a fine morning of spring the cheerful freshness of youth,—they may do this only by the influence of a common emotion excited by them" (*Lectures*, 1824, ii, p. 317). That Brown's secondary laws are all deduced from life, and play an important part there, no one will dispute; for a dull and uninteresting impression soon fades. We have still left the principle that what is re-membered is contiguous to that which preceded it; but we have eliminated certain unfavoured similars. The chief thing we have gained is the recognition of emotion as a middleman between images, a recognition strangely underrated by modern associationists, who casually refer to emotion as if they meant to ostracise it. Yet grant all the aids to association, and have we, then, established the associating principle? I think not. If these aids were what they purport to be, thought would still be as wasteful as the roar of the sea, and dash aimlessly hither and thither like the ocean waves. Thought would be in the condition of a goodly boat having fair sails but no propelling winds. If thought had to obey these secondary laws, instead of judiciously making use of them, we should die in the midst of plenty; for not what is striking, but what is pertinent, interests us, though what is striking may be easier to recall. In other words, of the ideas which have previously co-existed in some form, only those are ordinarily re-produced which are to the purpose, and those which are not, are as if they had never been in spite of liveliness, frequency, etc. Hence if the usefulness of things is in question, things useful are alone re-membered—liveliness, etc., helping here, though other aspects remain in the background. Every image re-incarnated in this manner suggests nothing and tends to suggest nothing, but gives place to another image of the same quality, decided by the continuing interest. As Paulhan (*L'Activité Mentale*, 1889, p. 17) expresses it: "A psychic fact tends to associate and to revive those elements which are able to unite with it for a common purpose," and "the tendency to systematic and inhibitive association is a property of the psychic elements." Or as James (*Psychology*, 1890, i, p. 259) says: "In all our voluntary thinking there is some topic or subject about which all the members of the thought revolve." (See also the same work (i, p. 568) where James allows for the influence of emotiona interest.) Or as Stout enlarges upon it in his "noetic synthesis."

Since the text has shown that all association is development of a process in those directions which lead to the satisfaction of a need, we are ready to agree that the need can only walk those highways and byways, selecting its directions, which it has walked before: unsuitable developments will be stopped, while suitable developments will be followed up. Our point of view, therefore, approaches very closely to the associationist standpoint if emotional interest be allowed its full due, and if that interest be interpreted as a need seeking to satisfy itself. Previous co-existence in some form, ignoring here recency, would still be a condition of re-instatement, yet only a negative one: *no co-existence = no re-instatement; co-existence = re-instatement, if desirable.* One thing would not suggest another like thing; it would develop out of the former, because a need was passing that way. Hence association or suggestion would be a secondary principle, fully explained by the pressure of needs. Interpreted in this manner, by saying that association is topical, we have at once determined more clearly the process of the satisfaction of needs and the so-called final laws of association; and indeed, by speaking of topical association or need-determined association we express in a simple fashion this double truth. The law of association might then read thus: actions, sensations, and states of feeling, occurring together or in close succession, in part or as a whole, are related in such a way that, when any one of them, or part of them, is afterwards developed in the mind, only those others, in part, or as a whole, can develop, such development being need-determined. Stated in some such language the association theory still retains its essential feature, *i.e.*, the fact of close relationship between ideational antecedent and consequent. It is possible that even observation falls under this revised form of Bain's statement.

Above all things it is necessary not only to admit changes in theory, but to give them their proper position. Bain, for instance, while admitting the peculiar effects of recency and emotional interest, effects which are most vital to all thought, allots them a few pages, and fills hundreds of pages with an unnecessary exposition of the nature of contiguity and similarity. In the same spirit he says that "in all difficult operations for purposes or ends, the rule of 'trial and error' is the grand and final resort" (*Senses and Intellect*, 1894, p. 609), and "the number of words that pass across the mind in forming a single couplet may be a hundred times those actually made use of" (*ibid*, p. 610), suggesting, what is the opposite of the facts, that a host of details is passed in review with the object of finding one that is not indifferent. James Mill supplies us with another striking example of the woodenness of associationist interpretations. He says "*Our* suggests *father*, *father* suggests *which*, *which* suggests *art*; and so on to the end" (*Analysis*, 1869, i, p. 80). In the same way, while he admits that "in the man who composes the coherent discourse, the main idea, that of the end in view, predominates, and controls the association, in every part of the process" (*ibid*, ii, p. 371), he yet explains that the main idea only vetoes irrelevant developments, as if the main idea were not an idea capable of self-development like other ideas. In agreement with Mill, Sully argues that "the action of attention does not effect a reinstatement of an image independently of the forces of suggestion," but that it can "aid in the realisation of certain of these tendencies rather than of others" (*Human Mind*, 1892, i, p. 346), as if attention were anything outside the ideas or needs. Brown alone freely allows for the play of interest, and it seems difficult to understand why he has had no determined followers. At all events, the half-heartedness with which new facts have been welcomed by associationists, has largely assisted in depreciating their theory altogether.

If the process of association expressed a great truth chained to a great untruth, so much cannot be said for the way associationists conceived the individual ideas. As this subject is treated elsewhere (sec. 107), we need not enter into detail. Only this much may be said, that association ideas have a logical completeness which is essentially absent in the product as we know it. The five-sense features were supposed to be ever present, while the many other sense elements, feelings and relations were neglected when they were not ignored. The feelings, too, were given a place which was far from expressing their natural position in the series of systems.

Certain cases of quasi-associations are best disposed of here. In re-instating a certain remark, there appears along with it the open book in which I read it, as well as the picture of the locality where I was at the time. Examining this accidental instance, I come to the conclusion that the remark, plus book, plus locality, were in the first instance, for no matter what reason, welded into one fact : remark-book-locality. In some occurrences, therefore, what seems the re-production of one idea by another is really a single image. So Sully, *Human Mind*, 1892, i, pp. 330-4; Paulhan, *L'Activité Mentale*, 1889, pp. 429-43; Ward, *Psychology*, 1886, p. 57, col. 2; Wundt, *Psychologie*, 1893, ii, pp. 437-53; and Stout, *Manual*, 1898, p. 94. A different explanation applies in a set of related groups of systems. We are, for instance, interested in the locality spoken of, and we cannot resist the temptation of going off at a tangent for a moment as we re-collect the remark. Here re-collection is topical and indirectly developed, though the seeming co-existence of two points suggests associative re-integration. Disallow the interest, and the locality will not obtrude itself. In proportion as we lack strenuous purpose, so distraction—thinking in bits—becomes an important factor. Again, one particular object has so often been re-collected after another that when the necessity for sequent re-production has gone, we yet bring back the second through forgetfulness of the particular chief need of the moment. To put it paradoxically, we will that which we do not will; or, to be more precise, the lesser needs, as Paulhan urges, are acting independently. Again, two things have been continually thought of together, and if they are sufficiently close to one another, they are gradually embraced in a single act of attention, fusing and thus becoming one. In such an instance we have a twin object before us, and not one object re-producing another. The same would hold when we re-collect an object as moving. Lastly, since every object is psychologically a complex, and since, for instance, the re-collection of a man's eyes require usually the re-collection of his face, it follows that all objects observed or imagined, contain many features more or less inseparably united. This process is named by Sully, among others, assimilation (*Human Mind*, 1892, i, pp. 178-84), and intuitions form a good illustration of it. Binet, having the same facts in mind, speaks of the law of fusion (*Le Raisonnement*, 1886, pp. 96 ff.). These elements are like the flour and the water which the baker kneads together in a dough: their bare presence does nothing towards their entering into a union; a need accomplishes that. Our brains resemble a civilised country with high-roads, by-roads, field-paths, rivers, canals and railways, as well as arable land and pasture land, mountains and hollows, towns and villages, and authorities. In this orderly land, the needs form the population. Abolish, however, all useful institutions in a country, and you cripple the individual; and so the absence of pioneering profoundly affects the manner in which needs are satisfied.

Additional References on Association.—Aschaffenburg, *Experimentelle Studien über*

Associationen, 1895 and 1897; Bain, *On Association Controversies*, 1887; Bergstrom, *The Interference of Associations*, 1893; Bergström, *The Relation of the Interference to the Practice Effect of an Association*, 1894; Bourdon, *Les Résultats des Théories Contemporaines sur l'Association des Idées*, 1891; Bourdon, *La Succession des Phénomènes Psychologiques*, 1893; Bradley, *Association and Thought*, 1887; Bradley, *On Prof. James' Doctrine of Simple Resemblance*, 1893; Brochard, *De la Loi de Similarité dans les Associations d'Idées*, 1880; Calkins, *A Suggested Classification of Cases of Association*, 1892; Calkins, *Association*, 1896; Calkins, *Short Studies in Memory and in Association*, 1898; Cattell, *Psychometrische Untersuchungen*, 1887; Cattell, *Experiments on the Association of Ideas*, 1887; Cattell and Bryant, *Mental Association Investigated by Experiment*, 1889; Cordes, *Untersuchungen uber Associationen*, 1901; Cornelius, *Das Gesetz der Uebung*, 1896; Deffner, *Die Aehnlichkeitsassociation*, 1898; Goblot, *Sur la Théorie Physiologique de l'Association*, 1898; Hoffding, *Die Bedeutung der Wiederholung*, 1883; Hoffding, *Ueber Wiedererkennen, Association, etc.*, 1889-90; Höffding, *Zur Theorie des Wiedererkennens*, 1892; Howe, *Mediate Association*, 1894; James, *Mr. Bradley on Immediate Resemblance*, 1893; Jastrow, *Community and Association of Ideas*, 1894; Jerusalem, *Ein Beispiel von Association durch unbewusste Vorstellungen*, 1894; Jost, *Die Associationsfestigkeit*, 1897; Munsterberg, *Die Association successiver Vorstellungen*, 1890; Scripture, *Ueber den associativen Verlauf der Vorstellungen*, 1891; Smith, *Mediate Association*, 1894; Trautscholdt, *Die Association der Vorstellungen*, 1882; Ward, *Assimilation and Association*, 1893; Witasek, *Ueber willkürliche Vorstellungsverbindung*, 1896; Wundt, *Sind die Mittelglieder einer mittelbaren Association bewusst oder unbewusst?* 1894.

91. -IDEATIONAL COMPLICATIONS.

We are now possessed of the static and dynamic elements of thought; but that is still far from saying that our analysis is complete. If thoughts were like dust grains which the wilful winds whip hither and thither, now into this nook and again into that open plain, little else need be added. As the matter stands, however, thought reflects the complex organism and shapes itself into a unity, its cells developing into a variety of connected tissues. On this account we must continue our dissection of ideational compounds, though we have concluded our examination of ideational elements.

92.—THOUGHT REPRESENTS THE SATISFACTION OF NEEDS.

The simplest case we can select for study, is a bare amplification of what we have analysed above. Suppose we say that the Sophists stimulated the thought of Socrates; Socrates stimulated the thought of Plato; Plato stimulated the thought of Aristotle; and Aristotle stimulated the thought of the succeeding centuries. In this instance, leaving aside niceties, the development of thought is consecutive or telescopic, *i.e.*, *A* develops into *B*, *B* into *C*, *C* into *D*, and *D* into *E*. In rambling thought, speaking generally, this *A-B*, *B-C* method is common; and poor disputants scarcely launch a subject, before they leave it for another one suggested by a portion of the argument. Yet where thought is to focus a series of events chronologically, this mode of procedure is in place. However, thought is more often a centre where each unit is connected, not with its predecessor, but with the centre alone. For instance, we may say that "X. wasted his time, his opportunities, his fortune and his health before marriage. When he was married he neglected his wife, his children and himself. His influence on his family, like his influence generally on those who came into contact with him, was pernicious. No one was ever heard to say a good word for him." Here is a centre around which a regiment of systems is quartered. We wish to express what evil we know of a man, and in centrally determined sequence we re-collect what is pertinent. *The points do not suggest anything or each other, nor are they related one to the other; but they radiate directly from one idea.* When we ask: What defence can you offer of your conduct, of your enterprise or of your philosophy, then the terms "conduct," "enterprise" and "philosophy," are the magnets around which groups of systems arrange themselves. Nor is this class of thought occasional or unimportant. If we reflect that broad-based needs ever seek to be satisfied, and that nothing otherwise interests us, we must conclude that thought is pre-eminently centralised, and it is thus that a need arises and initiates such processes as lead to its satisfaction. Moreover, even where the order is chronological, the need for such order alone secures the stream of thought, and, therefore, a central unit is always in command. Hence units are not followed in endless succession by other units; but every train is arrested or developed, as the controlling need may determine.

If thought, as such, is need-determined, we shall have to beware of adopting the ordinary mechanical notions as regards ideation. A man may imagine that once an image is developed, the host of others linked with it, tend also to develop. So, too, it may plausibly be urged that the more striking and oft-repeated ideas will specially press, or tend to press, towards the front. On the other hand, on theoretical grounds, we have to discount these suggestions. As thought is need-determined, *i.e.*, determined by *functional readjustment*, and as the nature of economisation excludes what is superfluous, we should expect that, normally speaking, no more is developed than is to the point. Thus the most significant aspects will not as a rule be even suspected when the least significant ones are being sought. [*Test.*] Accordingly, only what is relevant will normally tend to appear, since any other method of procedure would be stupidly wasteful, and, therefore, checked by natural selection. Needless to say, introspective experiment seems to bear out this contention.

See the chapter on Relative Suggestion in Stout's *Analytic Psychology*, 1896; see also Wundt, *Psychologie*, 1893, ii, p. 476, where he defines apperception as a "function causally determined by the whole development of a consciousness," a definition which scarcely describes the elastic processes enlarged upon in this work.

93.—SOME RESULTS OF ECONOMISATION.

The results of economisation must now be faced once more, and with them the nature of secondary complications. In the crude history which we have supplied of the bad man X. several points require elucidation. In a more primitive condition than that of the average adult, perhaps only the one notion of X. being bad could be entertained, while the moment another idea developed the first one would be swept away. This is not so with the average human being. Having settled that X. is a bad man, we may investigate his state without for a moment forgetting what we think of him. If we turn inward, it would be preposterous to say that, like the famous writing on the wall, the words "X. is a bad man" persist. Economisation has reduced this awareness to a trace, an area being kept sensitised, in contact and ready to react. When, therefore, I go into the next room to fetch a book, my thoughts, in walking, are far from it. Yet there is still a residue ready to react, and when that is gone, the errand is forgotten. [*Experiment.*] What is true of the central thought, is true of the whole process as expressed in the words which I employed. Every subsidiary unit remains semi-nascent, in agreement with the fact of recency, thus securing a coherent and progressive process. The units are simplified to the utmost. They do not dwell in some sub-consciousness, and they find no substitutes; only that little is re-membered which is essential.

94.—The Language of the Adult.

It is when we come to the word-sentence, that the nature of secondary and simplified complications is most striking. Indeed, so large a part do they play therein that it becomes difficult not to exaggerate. Generally stated one may affirm that the sentences which an adult uses are secondary complications, slightly modified according to familiar methods. We have, so to speak, said everything we have to say previously, since the situations we meet with vary but microscopically. Given an act and it is generally a repetition of some act; and given the need for utterance, and the sentence employed on a previous occasion will be employed once more. We have not, at any time, the whole vocabulary in view, from which we select a dozen words: these dozen words are practically given as a sentence by memory. When a state is more pronounced, we put in some term like "very"; and when "Brown" is meant and not "White," the names are changed. The sentences are constructed on exceedingly well known models; and what adaptations are needed, are quickly found because we are well acquainted with them. Whenever familiarity is absent, we struggle painfully before we can properly express ourselves. Thus only he who has studied resolutions or documents, can draw them up with ease or draw them up at all; and thus the educated man talks well, because he is a dealer in secondary complications. Only an infinitesimal portion of a man's phrases shows to any extent the bloom of freshness. Illustrations of the more intimate speech-processes are near at hand. In learning a new alphabet, some time elapses before we can readily write any letter we wish. Yet, if at this latter stage we try to write a word in this alphabet, we find that the letters cannot be re-developed in a flash, as is required. Only prolonged exercise allows us to write, read or speak with expedition. Should a difficulty occur, as it occurs in nearly every sentence which is at all modified, the time spent, as can be observed, is masked by the easy steps making up for the more difficult ones, *i.e.*, thought is active prospectively while the words are being uttered. [*Experiment.*] By this means groups of systems are ever readjusting themselves with but slight confusion. Ordinarily, then, we deal in word-sentences which have but a spark of immediate or direct meaning, an unusual context alone acting as a challenge. We see, therefore, that an atomic conception of the ideational process—as where self-satisfied ideas are said to *suggest* contiguous or similar ideas,—leaves us completely in the dark as to its drift, while, at the same time, we come to lose faith in the reasoning faculty as ordinarily interpreted. (Sec. 215.)

The thought currency has no standard value. Our depth of insight, our justness of perception, our delicacy of definition, vary incalculably. There is little we read of even light literature which does not grow in intelligibility by careful re-reading, and we constantly discover in this way that we have overlooked a great deal and misinterpreted much. Hence the almost endless differences in intellect. The poet who describes the impression made upon him by the strain of some wild bird, is hardly ever satisfied with his word-painting. When the lines reach his readers, the colouring is interpreted most variously: some who are lovers and students of nature follow pretty closely; others understand fairly well; most have a shadowy suggestion of delight; and not a few miss the meaning entirely. The thought currency is not turned out by machines—carefully weighed, and each coin bearing an intimate resemblance to every other. Its counters, on the whole, do their duty; but that is all. They are subject to rapid wear and tear, appreciation and depreciation. A farthing now becomes a sovereign; and again the touch of some one else makes it counterfeit. Because two men read a passage with equal fluency, and apparently with equal intelligence, it by no means follows that the understanding of each is a copy of that of the other. Approximation, it is true, is ordinarily attained; but the finer grades, on which the value of a contribution depends, are perhaps overlooked by one or by both. Only a diligent and long-continued education provides men with a comparatively precise understanding of what they meet with. We have, therefore, to fight our way to the forefront of knowledge, and there is not a road over which we march but we have to be alert. Once assimilation, through organised reaction, has proceeded far, we are able to comprehend all that is below us. Ideas must be known, as a whole, to be easily grasped. Hence the need for a preliminary process of study, while sustained repetition is required to overcome the gnawing propensities of oblivion.

95.—WE ARE NOT RESTRICTED TO ONE UNIT OR IDEA AT A TIME.

A pregnant proposition of a new order has struggled to the fore in the last section; it is that we are not limited to one unit at a time (sec. 38). Hence, in carefully testing a proposition or a statement, we find that there are perhaps dozens of brain centres sensitive, a condition which the fact of recency makes readily intelligible. Yet we know that a complex argument, like many a German sentence, may be too much for us; though there is no problem, however complex, which is not conceivably easy to some possible intelligence, while it will be granted that the lower animals would find almost the plainest human problem intolerably hard.

Educated thought requires that we should have in view a multiplicity of details, and that we should be on the alert for many possible contingencies. What is more, we can deal with more than one subject at a time. At first the growing school boy may have to stop in his walk if he wishes to practise what is to him the new art of whistling; but he soon learns to do both things at the same time. So also in learning to play the piano, we can only conquer by dividing the task. It is, therefore, purely a practical question how many centres of thought or activity may be busy at a time. We can do thus much and no more; and within such limits, a number of subjects are possible. Engaged with both eyes and one hand, I trifle with the other hand, while re-producing some complex occurrence utterly foreign to the work and to the trifling According as the work or the re-produced occurrence draws more heavily on the fund of attention, so one or the other receives less attention. The quantity of subjects we can entertain is, therefore, not limited, except that with human beings any considerable difficulty absorbs nearly all the available attention. A race with a brain of a higher type could perhaps follow twenty or more serious subjects at once. [*Test this section.*]

96.—General Methods in Thought.

I asked myself whether I had ever before seen a certain face, and in a moment that face was re-produced. We wish at this stage to know if the connection between question and answer was direct or indirect. On closer inquiry the latter proves to be the fact. Times out of number I had put similar questions, and the demand hence became connected with the active tendency to recall along lines of similarity, identity, recency, etc. We are, therefore, dealing with a secondary complication. The question relates to an attempt to re-develop what is relevant, and thus the secondary process, instead of rushing to a conclusion or acting on its own initiative, reaches it in predetermined zigzag fashion. There is, of course, no need to imagine the active tendency to be elaborate, or connected with a sentence of so many words, since economisation is certain to curtail these luxuries. All that probably happens is that a brain area is readily sensitised, because it has been sensitised formerly. The very swiftness and matter-of-factness of the process is only what we should expect. We have an image, a connected active tendency and a resulting process.

What is true of the above problem, is true generally. I may, for instance, be puzzled because there lies on the table a certain book which I do not remember to have taken from the shelves. [*Experiment.*] Suddenly I recollect that I have fetched the wrong volume. It is only apparently that the relevant answer stands in direct relation with the attitude of distraction. The fact is that the attitude of being puzzled is secondarily connected with the attitude of trying to re-develop what is pertinent to the issue, *i.e.*, what will explain the unexpected occurrence. We have here to do with a class of thought indirectly and not directly related.

Secondary complications are naturally formed in conjunction with every line of activity which is at all common, and such lines constitute the streets and lanes of thought. Accordingly, *whatever is important, striking, interesting, out of place, strange, obscure, useful, doubtful, subtle, pleasant, beautiful, witty*, etc., etc.—all these representing needs or stimulating them —*builds secondary complications of its own by which the trend of thought is in later life developed along well worn but unnoticed grooves.* Let us consider an example, the only complete one which my note book offers. Some one says to me, jestingly, that my income amounts to £x 15s. per day, a figure which is considerably higher than the correct one. By a method of further exaggeration, secondary in character, I rejoin that the true sum is £x 19s. 11¾d., the figures developing while I am uttering them. I was saying £x 19s., and, seeking all the time organically for further exaggeration, I added 11d. Striving to exaggerate still further, I affixed another ¾d. *While each step was taken for secondary reasons, the content of every step was similarly decided*, the sum 11¾d., for instance, being a figure frequently quoted. Should something not quite relevant appear, it is silently suppressed, and our search is continued along known routes. *Thus the general tendency as well as its expression is habitual.* [*Experiment.*]

Stout, in opposition to the above, argues that "of course each single pun requires attention; but the general trend of attention in this direction, rather than in other directions is a matter of habit" (*Manual*, 1898, p. 101). I have endeavoured to show that the distinction is not easily sustained.

Again, consider the process by which I solve an intellectual problem. The problem presents itself. With its presentation is connected the recollection of what most favours my theory; with that an attempt to find material which tends to contradict that; with that, that which negatives it; with that, what proves it to be but partially true; with that, what shows that the argument proves too much; and so on. The progress of thought is, of course, not so easy of prediction as here suggested, since every class of thought is connected generally with several others rather than with one. But usually different individuals display different well marked secondary complications which oscillate only within trifling degrees. The inconsequence, the stupidity or the geniality of an intelligence is ever determined by the class of secondary complications which have developed.

Take another illustration. I hastily read over a shop the words "Moral Decorations." "What," I mutter, "Moral Decorations?" it must be "Floral Decorations." Now I might have recognised my mistake by a chance glance in the direction of the word, and there it might have ended; or I might have warned myself against mis-reading this particular word over this shop, in which case the warning would have formed a complication with that particular word in that particular place, and hence on re-reading, the warning would automatically develop, *since we always try for connected thoughts when we are not absorbed.** The warning might, again, have been attached to the re-reading of those words generally, or to reading-matter as a whole or to life generally. Perhaps with the notion of the mistake has been combined the notion of preventing the recurrence of such blunders. In that case, the recognition of my mistake in this particular instance would develop into the warning not to permit the occurrence of similar mistakes. Such general rules, embodied in secondary complications, are common; they constitute a man's intellectual character.

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* In dream life we, therefore, take for granted what would cause grave doubts in waking life. Hence, in our dreams, those who are dead or at a distance may greet us unchallenged, and hence nonsense of every sort easily passes.

The quality of the secondary complications is of supreme importance in practice. Shallow persons employ shallow rules, while wise men are guided by maxims of deep import. Accordingly, for the seeker after truths, such rules as "observe closely," "test the statement repeatedly," "show that the contention is partly true, that the contrary holds, that it proves too much or too little," are bracing; and so with the rule always to generalise daringly yet guardedly, in an order which gradually extends in every direction from what is most related to what is least related. It is methods such as these that make intellectual progress possible, rather than the syllogism which is cumbersome and presupposes them, or Mill's Canons of Induction which are dangerous without them. (Secs. 65a and 136.)

No one who is not both cynical and perverse, would demand a moral justification of mathematics, since innumerable and sweeping truths have been deduced by their means. Their simple axioms have been indisputably useful. Not so with Logic. While boasting of certainty and infallibility, it has no fruits to show, only leaves bound up in ponderous tomes. In mathematics the simple law of identity is elaborated into a vast but graded system. In Logic we begin and end with certain so-called ultimate truths. While, again, mathematics have been actively applied in science, logic has remained in the hands of "philosophers," its rules being ignored by practical men. At the same time, the attacks on the syllogism have not abated since Locke gave the signal. To me it appears that a false psychology must mean a false logic, and that the barrenness of the methods of logic are the direct result of its disputable basis. Who would ever think in syllogisms? Those who, like Archbishop Whately (*Logic*, 1844, Appendix III.) apply them to obtain new truths, fail deplorably, and naturally the man who helps in doing the world's work, smiles when any one proves to him what no one calls into question. The shortcomings of the syllogistic method are evident. To begin with, the truths obtainable in ordinary life are derived from the judgment and not from demonstration. We are sure of very little, and we make sure of less because of the difficulties in the way. This indeterminateness alone would prove fatal to the use of the syllogism. However, its defects lie deeper. Let us choose a syllogism for illustration.

> All towns with a high-rate of mortality have a bad system of drainage;
> Blank town has a high rate of mortality;
> Therefore, Blank town has a bad system of drainage.

Now many a person will agree with the reasoning of this syllogism, and yet, in a strict sense, our syllogism, by its straight form, has probably strengthened error. To begin with, the plausible major premise is incorrect, for the cause of a town's mortality rate is not to be settled in so off-hand a manner; and when we come to the minor premise it is quite likely that the mortality figures are hear-say or unreliable, and that the mortality is the reverse of that suggested. Hence we obtain a faultless conclusion of no value. Indeed, if we had ascertained that the facts were as we had stated them to be, a formal syllogism would be a pure luxury. What we need is a scientific catechism which shall allow for probability and which shall suggest methods of finding truths. We ought to be ready to ask as to the major premise: on what is the statement based? Does it contain official expert reports stretching over many countries and years, and are there no exceptions?

What are the verified reasons for this strict relationship? If, after that, the answer comes that it is reasonable to connect the two, we must say that the conclusion may be regarded as fair, but not as proven, and that the facts may even bear evidence to the contrary. So also must we proceed with the minor premise, and judiciously examine the statement by a number of queries as to its precise basis, and whether there is not a flaw somewhere. A catechism of such a nature might put even the splendid results of mathematics to shame, stimulating and guiding inquiry in the humblest as in the highest departments of life.

Ordinary reasoners well illustrate the absence as well as the need of method. They readily assume that, say, the relation of the figures prove Board Schools to have reduced the number of criminals; they forget to question the correctness of the figures; and they do not ask whether legal or social influences have produced any changes. To this must be added the general presence of strong bias which accentuates the error. Hence only a deliberately elaborated system of education which takes account of these weaknesses and makes them impossible, will prove of service against the tendencies generally prevailing, especially where matters of "opinion" are concerned. (For criticisms on the syllogism, see Mill, *Logic*, 1875, bk. 2, chs. 2 and 3; Locke, *Human Understanding*, bk. 4, ch. 17, secs. 4-8; Sigwart, *Logic*, 1895, trs., pp. 359-62; Spencer, *Psychology*, 1890, ii, pp. 6-116; Lachelier, *Théorie du Syllogisme*, 1875; and Jevons, *Principles of Science*, 1877, who holds a modified theory which almost equally deserves the reproach of being mechanical and unsatisfactory for the advancement of learning.)

Mill's canons of induction (*Logic*, 1875, bk. 3, ch. 8) help us somewhat along the road; but they are still critical rather than constructive. Suppose I wish to shorten a string, how am I to do it by Mill's method? If the canons are of no assistance to me in that, they fail in what is the normal business of thought, *i.e.*, to meet contingencies. The moment my inquiry suggests a solution, the canons become of some value; but even here, how am I to apply the principles of agreement, difference, concomitant variation or residue? How am I to judge instances where the truths to be obtained are imperfect ones? Without, therefore, ignoring the canons, we must persist in our contention that their object, like that of the syllogism, is final criticism rather than the active discovery of truth.

I wish to solve the problem of the relation between crime and Board Schools, and consult Mill's canons. Now if, apart from Mill, I do not know how to proceed, I shall never make a beginning. Suppose I do proceed, how am I to sift the figures? I ask my informant, "Are you quite sure about your facts?" What if he answers "Yes; I am quite sure"? In that case, the solution of the problem, if it depended on the canons, would remain in a mournful condition. I may think that I have arranged every detail, when I have but dreamily skimmed the surface, or I fancy that I am triumphantly applying the rules, when, in fact, I am wasting my time. A stray hint thus appears a complete induction. Mill's chapters on the moral sciences are, in this manner, built up in a somewhat fanciful fashion, statements which are not even half-truths being paraded as thorough bred inductions. His canons, therefore, we conclude, presuppose that we are carefully trained observers; that we have garnered a large stock of useful information; that we are disciplined in recognising hidden resemblances and differences; that we are inventive, methodical, and the like. In other words, his laws, valuable in their way, form but a trifling portion of a true scientific canon.

The nature of a general unit or idea must now be fairly clear. We read the words "Moral Decorations." That being a not previously known complex, it necessarily appears strange. With the fact of strangeness has been systematically combined the process of doubt and re-examination, and hence in every case of strangeness the thorough student doubts and re-examines. [*Examine cases of strangeness.*] Similarly we may resolve that, subject to tests, whatever seems useful should be applied not only once, but always; not only in the given direction, but also in related ones. When, accordingly, I chance to recognise that deliberateness of speech has been useful on a certain occasion, that recognition develops into the tentative recognition that deliberateness of speech, action and thought is always desirable for every one. We must not, however, strain the significance of language. The recognised slowness in deliberation, in connection with its effectiveness, may of itself impress us, so that we dwell on both aim and slowness with the result that the re-collection of an aim suggests the slowness. Hence when a new notion occurs to me, that fact alone sets me generalising without the interference of language and without reference to the fact. Generally speaking, economisation will eliminate complex imagery and language. [*Observe such instances.*]

It seems somewhat strained to assume that the process of orderly development which I have sketched, quite accounts for the somewhat erratic course of thought. One wonders whether old ideas or those which are interesting have not some secret manner of entrance. The suspicion is legitimate; but a satisfactory answer is forthcoming. The organised notion of exploring out-of-the-way ideas and combinations of ideas is persistent, and results in keeping us in touch with much that would otherwise be wholly forgotten. So also such phrases as "old times, boyhood," etc., are organically attended to with fruitful consequences. Thus again the very pause in thought when it occurs, the very lack of action, is often organically connected with particular interests and lines of memories, and these latter are hence easily developed. In this manner I re-member connecting without deliberation the word "psychology" with any pause, thus ensuring persistent recurrence to the topic. It is in this fashion, by a multitude of organised arrangements, that breadth of thought and continuity of interest are maintained. We see here again that the flow of thought, as we know it in any case, is not determined by the particles forming the stream; and that for aught we can conjecture in any instance the flow may stop at any moment. Continuity of thought is due to the presence of highly developed needs, and if these needs are to be explained in terms of the secondary series, then it will be states of feeling and not states of imagery, as is popularly held, which will form the connecting link or force.

97.—KNOWLEDGE IS MOSTLY A SOCIAL PRODUCT.

Human beings are part and parcel of a natural and social order to which on pain of punishment they are bound to conform. Hence their reactions will be of a type which is both need-determined and secondarily social, and hence a huge accumulation of somewhat loosely connected secondary complications will be evolved which characterise man and men. If the individual possessed great natural sagacity he would quickly manufacture rational secondary complications. As it is, the contrary is true. The individual laboriously makes his own what mankind has already laboriously elaborated. Where he is much left to his own devices, the complications are of the crudest and most unsatisfactory type, the interconnecting or reasoning being reckless, sporadic and devoid of far-reaching relations. This doctrine of the slow growth and the social nature of secondary complications will solve many questions in animal psychology. For example, a human being is shut in a room, which he leaves, when he wishes, by opening the door. A cat, on the contrary, can only open the door, we are told, by a chance hit in her frantic endeavour to escape. When again shut in, she does not at once re-member the way; she is only a little quicker in escaping. [*Observe, if possible, such cases.*] Hence the power of interconnecting or reasoning is by many denied to the cat. However, if our contentions are justifiable, it will be seen that the adult human being has an education and a practice which the neglected cat entirely lacks, and that the educated cat would be far superior to the untrained man. The educated man is not a man full of invention; he is one who has the capacity for learning, and has stored up methods of answering all sorts of questions. Fundamentally, the chance hit and the inferred method of opening the door are on the same level. Both are equally automatic, or rather organic. (Sec. 233.)

98.—THE ORIGIN OF NEEDS AND THEIR CLASSIFICATION.

The human organism may be regarded as developed by natural selection to produce ova, and to protect them while they are in need of protection (Foster, *Physiology*, part 4, 1891, p. 1555). With the latter task fulfilled, man's mission is at an end, and he turns into food for worms. This mechanism which we are, has a quantity of explosive properties. "The eye craves to see, the ear to hear, the hands to touch, grasp and handle" (Rümelin, *Ueber das Wesen der Gewohnheit*, 1881, p. 155), the stomach to digest, and the brain to settle differences between the other systems which constitute the organism, and also between the last and its environment. *That which produces the unstable condition at any time—chemical, mechanical, electrical, or what not—we may speak of as a need.* Needs, then, are the forces which set us and keep us going, and they may be classified as follows: (1) Permanent Needs, which embrace such activities as breathing and eating; (2) Periodic Needs, which comprehend the tendencies that distinguish the seven ages of man, such as infancy, play, school, courtship, adventure, staidness, second childhood; (3) Personal Needs, such as are implied in the original constitution of individual men; (4) Peculiar Needs, which are connected with the special surroundings of the individual; (5) Political Needs, which are traceable to our physical, historical and general social environment, and (6) Passing Needs, which come and go and are, therefore, of little importance. [*Add, if possible, to these needs.*]

In an ideal organism a pressing need would no sooner develop than it would be satisfied, complexity of process being absent. In the case of man, on the contrary, elaboration proceeds slowly and is cumbersome. Simple problems are solved easily enough; but the more difficult ones, which abound, occupy the brains of many generations. On this account thought is usually busied with some subject which it attacks from many directions. In other words, the majority of our individual notions group themselves round a few centres. We want, for instance, to find a suitable holiday resort. Stimulated by this need, we wander along countless ideational paths, always guided and guarded by the centra thought. At one point we re-produce several places; and at another, we re-produce what we know of these places. Perhaps we re-member what kind of a resort would suit us, or what resort has been recommended by friends. In this way half-an-hour is easily employed in meeting difficulties. [*Test such cases.*] Multitudes of thoughts, relating to the issue and differing in character, are requisitioned to solve one problem. ***Since needs***, then, ***determine the order of thoughts, we may speak of thought as need-determined.*** Ideation will, therefore, possess only one rule, that of relevancy to a topic. Mere similarity or proximity will possess no value.

99.—A COMPLEX IDEATIONAL PROCESS EXAMINED.

Let us examine a complex event—the best sample which, from a psychological point of view, my note book offers. I wish to go into the country, and to stay there over night. This develops, in walking, into the notion that I must at once move in the matter. But what shall I write? I begin, "I shall, except if compelled to lecture." I weigh the words. "I shall, except if compelled to lecture;" "except if" sounds strange; replace it by "unless." "I shall, unless compelled to lecture, be with you to-morrow afternoon and stay over night." I must add "if convenient;" and, on further reflection, "if there is room for me." I am becoming confused, and I try to retain the central thought by repeating several times, half aloud and vigorously, "I shall." I am successful. "I shall, except if . . . unless . . . (make it shorter) I am lecturing, be with you . . . stay with you . . . to-morrow afternoon, and remain over night if you have . . . if there is room . . . room for me." This is an abbreviated statement of a certain subiect of thought pursued under very trying circumstances. The not unusual determination to spend a day in the country was secondarily connected with the need for writing. That again was similarly combined with the needs for writing fully, clearly and succintly. These again were attached secondarily to the need for testing and recurring to every step. Again, the central need persisted throughout; and the sensitising of the area which was involved, probably meant the simultaneous sensitising of half-a-dozen secondarily connected areas. At the same time, effectiveness was produced by secondarily dwelling on each issuing thought. Thus in pursuing a subject, thoughts do not follow each other in prim single file procession; they tumble over each other like the waves returning from the sea shore.

99a.—COMPARISON.

In the portion of our problem which we are considering in the present section, I have had recourse more than once to comparison. In this aspect of intellection we have to study a new class of facts. When making a comparison, we observe at least two objects, and deliver a judgment implying that double observation. There are two objects simultaneously present. What we learnt in the second chapter disposes of any possible contradiction involved in realising at once more than one object. Attention, we saw, dealt with fields, not with points. We found no reason to assume that there was any necessary restriction as to the number of things attended to. Whatever the boundaries, they are incidental to the particular species or individual. We learnt that we can attend, and persistently do attend, to more than one object at a time (sec. 38). As comparison implies attending to two things in a related manner, it raises thus far no new issue. The problem is somewhat more complicated than those we have analysed, but otherwise offers no fresh difficulties. The peculiar ability is, of course, normally guided by fixed dispositions. The machinery of organised reaction moulds this portion of our intellect as it does every other. It is for this reason that we must enter more minutely into the problem before us.

We have considered the simplest class of comparison, where all three aspects co-exist. In steadily keeping in view the flame of a street lamp and its reflection on the pane of glass which bounds it on the side opposite to us [*analyse such a case*], we encounter an ideally simple instance; for the comparison of the relative brightness of the light and of its reflection is made while viewing both simultaneously. In the final analysis this means that two simultaneously proceeding processes end in a third which is their resultant. Of course the two images do not give birth to a third. They are only an inconsiderable fraction of the relevant total state.

In comparing two notes struck in order of time by a tuning-fork, we meet an apparent absence of simultaneity, in which particular this observation differs from the previous one. [*Test this.*] The point is to ascertain how the comparison results now that the objects are divided in time. Observation leads us to accept the following solution. Whatever affects an individual, especially when he is interested, leaves behind it a marked summary feeling which lasts for some little time (sec. 109). Though the auditory image has disappeared, the feeling which accompanied it lingers on. This hovering spirit indicates that the sensitised brain area is still sensitive. Were the affected locality to recover its equilibrium at once, there would be no lingering feeling. When, then, the tuning fork strikes the second note, there is still in existence a trace of the first. Hence the notes, while objectively separated, neurally co-exist. We broach, therefore, no new problem in the comparison of objects which succeed each other closely. It is true that they are not before us; but as the accompanying feelings are, something still co-exists even in the secondary realm. If one state be fainter than another, or vary in certain aspects from its neighbour, then we interpret this divergence in uniformity with custom. If one relevant total state were obliterated before a second total one succeeded, comparison would be inconceivable; but if we assume co-existence, through continued neural sensitiveness, the obstacles vanish. There is a clashing of forces with a consequent resultant force, the latter constituting the comparison.

Again. Instead of comparing two successive notes immediately after hearing the second, we can successively re-instate for comparison the two notes after a more or less prolonged interval. [*Test this.*] We are face to face here with no new issue. Having re-integrated the two notes in succession, the process above described is repeated. The feelings are not now so vivid, but relatively the differences have remained intact. Observation teaches us to discount the gradual waning of images and feelings. If one or other were not re-developed properly we should find, when occasion offered, that our comparison was objectively faulty.

In the example of comparing two successive notes, both were not simultaneously present. In general memory, also, re-collection of sight images is most incomplete, and normally comparison proceeds in their absence. Our analysis of organised reaction suggests that of itself: the minimum is nearly always the maximum for the attention. Whatever can be eliminated with advantage is generally dispensed with. Comparison is, therefore, never dependent on a careful scrutiny of a present or a re-constituted object. Intellection is no more vivid than needs prescribe. In satisfying itself a need is not bound to consider complete objects: it deals with the residues which, for its purposes, are just as good. Hence in thinking we are normally unaware of a swift succession of images. Not only so, but close scrutiny reduces rather than increases the number of images which we imagine to be hovering about. This harmonises with our expectations. A large amount of attention and time would be wasted if it were not so. Topical reaction or reasoning, to judge from time measurements, would be inordinately slow if complete imagery were an essential, while our memory does not even enable us to re-develop past events minutely (sec. 114).

It follows that, through the agency of economisation, thought is reduced to a procedure resembling algebra; only that the signs here are natural ones. The principle which serves as our guide in neural elaboration is that a portion of the whole shall act for the whole. Thus when a certain thought feeling evolves, we do not wait till it has developed, for instance, into poetry, but we interpret it to mean that we re-member the poem (sec. 127). Only when the note which memory sounds is dubious, do we repeat the lines. Such feelings, as previously stated, do not differ indefinitely in quality and warmth one from the other. *With varying occasions like feelings yield diverse results, time and what it brings with it being their interpreter.* Intellection is, therefore, not a short-hand, but a shortened hand. We employ legions of abbreviations and we make use of a quantity of arbitrary signs. It is only occasionally, therefore, that we write a word in full, and it is unusual to put down a sentence in its barbaric completeness. A psychology which considers the normal current of thought to be a stream of connected words and sight images or a succession of self-centred atoms, entirely misapprehends ideational activities.

We assume too much when we appear to regard sign thought as the lowest stage. Much of our thinking delves deeper. In ordinary reasoning or interconnecting even well-marked feelings are comparatively rare, and yet while the feelings are often vague, the resulting comparison or notion is perhaps a model of clearness. In these by no means infrequent cases feeling may be supposed to accompany, without indicating, brain activity the completion of which is signalled by the emergence of a conclusion.*

99b.—SEMI-CONNECTION OR DOUBT AND RELATED STATES.

When we have once mastered the conclusions arrived at in the preceding paragraphs, a problem such as doubt or semi-connection is easily disposed of. Thought is, of course, topical—a nerve area rather than a single nerve track being affected. When, therefore, I am in doubt, and I ask myself whether I had kept a particular promise, first Yes and then No issues as the answer, which latter reply, in see-saw fashion, is again followed by a Yes, and so forth. [*Examine instances of doubt.*] This movement to and fro is labelled a state of doubt or suspension. If no crucial fact is re-integrated which settles the matter one way or the other, we suspend our judgment till some such fact comes within our purview. It depends on the importance of the argument how long we shall debate within ourselves, while the completeness of the doubt is derived generally from the same source. In doubt we have a luminous illustration of topical reaction. The attention is bent on putting an end to the painful uncertainty; we seem to be looking for help. We throw the flood-gates wide open, so that the expected stranger may enter in readily; but at the same time naught else can pass, except when the attention flags. The nervous process is purposive. We do not cast our net indiscriminately, hoping that among our haul we shall stumble across the pearl of great price. We fish for the object, and for it alone; and frequently success rewards us. The need present is the stimulus which compels us to go straight for the mark, and it is also that which preserves us from wandering, if, indeed, we could wander in the absence of needs. It is this which decides that the process shall develop along a certain line.

In doubt there is something besides images connected with the topic, and that something is of importance, if only for the neural activity implicated: it is a thought feeling or combination feeling co-existing with the images, which tells us of what is going on in the workshop of the brain. When this is detected, we say that we are undecided. As the doubt grows stronger or weaker, so the feeling changes in force. This feeling is to us the doubt, and when the state of indecision is on the point of being removed, it changes, and we assert that the doubt is resolved. We must once more refer to our previous remarks. First, the feeling possesses no peculiar sign by which we recognise it, under all circumstances, as the feeling of doubt. The occasion determines our interpretation, and a similar feeling on another occasion would bear a different label. Secondly, time fixes its meaning. Observing that a certain feeling is connected with a wavering between decisions, it comes to be stamped with the same term as the wavering which it precedes, accompanies and follows.

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* See Sully, *Comparison*, 1885.

When we hurry onwards in thought, or when a subject interests us little, the debate is short. As the feeling appears more or less decided, so we say "I doubt it" without a moment's hesitation. The same state, the same word-sentence. As in comparison, so here, we do not wait till the see-saw imagery emerges; we are satisfied with the premonitory feelings. In such instances, they form the basis of judgment, while the end of the process, the outcome of which they are, is foretold by their presence.

In quick thought, or when we view a microscopic section of it, this feeling is wanting; or, at all events, it is not easily recognisable or nameable. The doubt is raised and settled in the physical regions. In the secondary world we only observe the result of decisive neural activity.

In "comparing" and in "doubting" we assumed, for convenience, two objects and a resulting judgment. The number was chosen arbitrarily. Three, four, ten, twenty objects might have been involved. Largeness of contents does not change the venue, as the principle remains the same.

What is asserted of doubt generally, is true of all shades of doubt. A similar analysis to the foregoing yields like conclusions if we study such graduated states as affirmation, denial or counter-connection, hesitation, belief or part-connection, conviction or perfect connection. [*Study experimentally examples of each.*] In each of them investigation corroborates what is shown above as to doubt or semi-connection. Other conditions, too numerous to recite and many of which yet await naming, will probably yield result in consonance with the above analysis.

99c. —GENERALISATION, OR TOPICAL REACTION.

In grappling with any problem whatever, in doing anything at all, we act on general principles, i.e., we generalise. Let us examine a particular instance. [*Test this.*] We stay at a farm house, and we observe a labourer feeding the animals. In one stye there are two pigs, one lean and the other well-nourished, both of them taking their meal out of one trough. The labourer watches stick in hand. Frequently the sleek one glances round; it would like to drive its lean companion away, but is cowed, since it knows the stick too well. Here we encounter the principle of generalisation. The animal acts as he acted before. A stimulus which once had an unmistakable effect, has the same potency now. What is true of one occasion holds good repeatedly, and of similar occasions. Had the pig not re-acted, generalisation would have been absent, and this power is proportional to the rapidity, delicacy, carefulness and sweep of the re-action. As living creatures vary in this respect, so does their ability to generalise vary.

The neural system is the result of adaptation, and consequently its manner of reaction accords with the surrounding conditions. The general order is matched by a particular one, and the latter is developed out of the former. This is true of the bodily functions generally. If food-stuffs changed their nature capriciously, and kept rapidly changing, the alimentary organs, being unequal to the strain put upon them, would succumb. The bodily functions are fitted only to an environment such as they are at present placed in or form part of. So with the brain which reacts in a manner conformable to the conditions under which it has developed. Transferred to an environment where re-action was uniformly irrelevant, it would fail. Within certain broad limits, then, the quality we are examining is useful to the individual and to the race. To act as we have acted before, is normal to all life, and indeed to things generally. Similar actions are everywhere followed by similar re-actions. The greater capacity must be based primarily on the greater neural sensitiveness.

The generalisations of ordinary life are not formal; they are not expressed in words, feelings or images; and when they are so, they remain none the less organised. A certain object is membered or observed, and when the same or any other closely resembling it is met with, it is looked upon as an acquaintance. Careless thought points to the absence of schooling; reckless generalisation is its embodiment. Animal, child, savage, man of culture, all respond similarly to a repeated stimulus. There is nothing mechanical about this; for we do not necessarily re-act, and we are all more or less circumscribed in this respect. Consider an example. A. advises B., who is not highly intellectual, on some trifling matter. The advice is followed, and the episode has terminated. Suppose B. had suggested the same thing to A. who is keen in detecting resemblances and acting on them. He, too, accepts the hint, and though not dreaming of any verbal generalisation, he nevertheless acts as if he had generalised in words. He possibly perceives likeness on an enormous scale in most widely divergent directions. No re-collection perhaps survives of the incident which let loose the dogs of generalisation. From a formal standpoint he knows nothing of the various notions, *i.e.*, he does not connect them into one system of thought. If in early childhood his nervous system had been well trained and he had continued to move among persons of his own type, the widest truths would come to him without the intervention of any verbal process. The brain in him re-acts delicately, faint feelings alone being discernible. [*Deliberately observe yourself whilst generalising.*]

Suppose, moreover, that he instantly formulated the proposition: "Let everything be appropriately said, done and thought." Our problem remains unchanged. At worst, the words mean nothing. At best, they are a summation of previous incidents or a foreshadowing of what will happen. The verbal generalisation is a formal generalisation, and so far an action which is repeated. As we give body to the words, with the assistance of the imagination or of research, so the verbal skeleton is clothed with an armour of fleshy fact. Their value is instrumental. With the aid of words, since they are readily reinstated, we attain to new truths, and their merit lies in that the neural process corresponding to them is one, *i.e.*, covers or superimposes itself. Hence a generalisation may appear irresistible to us, and yet be false, because the covering or the correspondence is artificial. If *A* is *A*, it is only because one stimulus is generally followed by one reaction. If the reaction were different, *A* would conceivably not be *A*. The fundamental properties of things give rise to the law of identity (sec. 185).

Generalisation is re-action, and neural sensitiveness, acquired or inherited, is here the essential. Wise and deliberate training, and a judicious study of others, enhance its worth while thought and language express its method, but are not the capacity itself.

99d.—ABSTRACTION.

When a certain aspect of an object is singled out for inspection, we are said to abstract. Thus we may be thinking of the hands of a man, and neglect the man of whom they are a part. Like every human capacity, that of abstraction is, of course, susceptible of nice cultivation; and that is all one can say. Taking a large view, the reader will see that *in all integration or observation we abstract what is integrated or observed.* A particular human being whom we are observing at a particular time, is himself only perceived in part, while we also abstract the environment. The fact of abstraction, as usually understood, is of no psychological importance. As long as we cannot grasp the whole universe in a flash of thought, so long *all* primary and secondary systems are abstractions.

100.—ATTENTION AND COMBINATION.

The machinery which is to satisfy our needs might be considered as not complex, each need pressing it into service to the extent required. It might be said that when one need is satisfied, some other need will take the initiative, or, in default of a need arising for a time, the mechanism will rest. Some aspects, however, of the nature of the neural structure profoundly qualify and modify these expectations.

First of all, the facts teach us that the brain's working habits permit no rest in the waking state. Hence needs come to be connected with the mechanism itself. When there is thus no ostensible necessity to think, we are yet compelled to find some occupation. Casual happenings are then passed in review, and casual objects detain us for a few moments. Much of our time is thus idly spent in building castles on desert islands.

Again, the quantity of work put forth by the waking brain shows no sensible variation from minute to minute or from hour to hour, its capacity for labour remaining almost the same. We are compelled to attend to just so many details. If we are listless, we catch indifferent noises and are worried by otherwise indifferent bodily sensations; and if we are interested in a subject these noises and sensations are absent, their place being taken by other details, the same in quantity. Hence also the fact that if a task absorbs little of our attention, our thoughts are occupied with a second, third or fourth task, there being as many topics of thought as will make up the necessary round of details.

Once more, brain areas become prostrate when continuously engaged. Owing to this the neural work has to be distributed, the current of thought periodically shifting its direction; that is to say, under normal circumstances we do not satisfy a need at once, if its satisfaction is to occupy much time. We change the subject; we defer it; we measure out a little time to each of many needs. [*Experimentally test.*]

Moreover, whenever in thinking we meet with obstacles, we, as a rule, overcome them only when a strong need to persist is present. The capacity for tiring or exhausting work, or effort, is at first very small, slight insistence creating distraction and prostration. With practice, however, this ability, like other organic abilities, grows so considerably that in the professional thinker the more rational needs come to exercise a valuable control over the stream of thought. So habituated does he become to deliberate advance that he tires himself continually without having any suspicion of the fact or even against his wish. Between the keenest and the most lax attention, or betwixt the sleepiest doze and the most lucid effort, there is nevertheless only a difference of degree. There is no more a loading of dice, or a tampering with scales, in a great than in a small effort, or else the loading and tampering go on in every act without exception. No connection is traceable between great effort and indisputable awareness; for normally the effort which is made follows directly, no interconnecting or reasoning precedes, nor is there any near or remote consequence, aim, self-direction or self-consciousness present. Economisation is responsible for this result.*

101.—ECONOMISATION AND COMBINATION.

While it requires a chapter (ch. 3) to explain the theory of economisation in all its bearings, we must yet refer to one point. At the first blush it

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*For a defence of the opposite view, see James, *Psychology*, 1890, especially i, pp. 453-4, and ii, pp. 573-6.

might be thought that only where several needs hotly compete for the field of attention will economisation enter as moderator. This is not so. Being an important function both in the primary and in the secondary order, it comes to be applied universally. Hence we economise everywhere, even where economy is superfluous, as when a need only partially drains the neural reserves. The process of economisation, like the process of attention, knows no distinctions, and jealously removes whatever may possibly exceed full measure. In this manner, the process being unconditional, waste is reduced to a minimum.

102.—MEMORY AND COMBINATION.

The matter of thought is drawn from the past. Hence *we may speak of thought as the cross-classification of systems or the reproduction of what is relevant.* Nay more, *as all thought is re-developed, so all re-development is thought.* Whether I see a book or open a door, as I have done on so many occasions, or whether I bring all my skill to bear on a problem, the issue is not affected.

Regarded in the above light, the process of reasoning assumes somewhat the following forms. (1) If a difficulty, muscular or neural, is given, we apply organically more energy to its solution, or generally speaking, we increase or decrease the degree or the quantity of anything which is under consideration. Thus the door yields to greater pressure, and an idea emerges owing to greater concentration. (2) We organically re-collect whether the same problem has occurred previously, and if it has, memory perhaps provides its solution. (3) We try to re-develop a situation alike in some few respects, with the same end in view as in (2). (4) We review the problem in the hope that the study of the difficulty may supply its solution. (5) We reconstruct our problem or a similar one, instead of merely re-developing it, and watch the results. (6) We systematically go over the problem, testing its every part by appropriate re-collection or examination. Individuals differ, of course, in the application of such methods. A highly developed system of education would, however, not rest till the best means of attaining the best results were discovered and duly taught to all and applied by all. At present bare chance decides what methods are resorted to by any one person.

103.—HABIT AND THOUGHT.

An individual, X., reaches a certain sentence in a book, skips it, and goes on with his reading. If we unceremoniously peep into his brain we only discover that when a certain set of printed symbols was in sight, his attention rushed past them. If we ask X. the reason for his peculiar procedure, he is surprised at our inquiry, for he had not noticed the particular act referred to. If we press him to exert his powers of introspection, he is brought to acknowledge that we observed correctly, stating at the same time that he is at a loss to account for his behaviour. As we are interested, we continue our investigation, and learn that he always skips illustrations in an argument. We mention this to an acquaintance of his, who offers the following explanation. Some years ago this acquaintance had a long conversation with him, in which he convinced him that illustrations are misleading. After this X. struggled hard to ignore them, until finally he reached the stage at which we found him. [*Observe yourself as to above.*] He had fully formed, as men say, a habit. Now this habit may be considered automatic since it seemingly lacks all relations; while the process involved in its formation may be regarded as typical of secondary activity, habits being, as it were, secretions of thought. Assuming, what we have seen is contrary to fact, that the secondary complication referred to is dead and has nothing to do with the psychologist, we must inquire into the nature of the process which led to the production of the habit. The reply we obtain amounts to this. A certain need is present. In the course of its being satisfied, many vistas are explored. Finally, a resolution is arrived at; the man persists in its application; and the formative process and the resolution are after a time forgotten. However, every line of thought which was pursued, the resolution arrived at, and the persistence in its application, were themselves due to secondary complications. The need itself was likewise the result of previous activity. All that we learn, therefore, is that when a new need is evolved, a familiar process is set going which ends in the construction of a secondary complication. Hence when we are said to deliberate, we act from habit as much as when we are said to act without deliberation. Had it not been for the multitude of fixed acquisitions of which the process consists, the process would be unintelligible; and as these acquisitions decrease in number, so the problems to be solved have to be simplified proportionately. We are, then, driven back to the structural aptitudes with which the infant is equipped, and we must also inquire into the origin of our needs. We cannot arrest our backward steps until we reach the time when life's drawbridge was lowered, since inquiry shows that the process of economisation begins with birth, and that the complexity of thought evolves with growth and with the complexity of the neural structure.

The human organism, seen in this light, may be regarded as a bundle of habits. Hence arises the question as to how these habits arose. Taking the history of a man to be one with the history of life, we might argue that the habits inherent in the human structure take their origin precisely as did the habit of ignoring illustrations, which habits, again, are inherited by the next generation. Plausible and suggestive as such an explanation may be, it proves of little value on examination. We saw that the formative process becomes simpler as we retreat to infancy. Hence as we straggle backwards to the amoeba, we are still left face to face with the initial problem. Each habit has been, it is true, acquired; but habits were responsible for the acquisition. Thus we may descend in the pit of life till the phrase "formation of habit" loses all meaning.

We have assumed the transmission of acquired tendencies; but this is a doubtful doctrine, since variations in the germ, sifted by natural selection, are the chief present-day explanation of the animal structure and of instincts. As far as the matter is open to scrutiny, there seems little reason to doubt that acquired habits or characteristics are but seldom transmitted.

What is true of the habit-forming process, holds good of the needs which are the stimuli to action. These, too, have their roots in favourable variations which have been preserved by natural selection. From the veriest dawn of life, want and satisfaction of want have been intimately related, and the neural system has developed along lines which best connect and satisfy these.

Moreover, no other explanation of the development of thought appears for the present feasible. If what happens is not in general accord with this suggestion, what is the alternative theory? There seems no reason why we should go behind the principle of growing complications in the individual and the preservation of favourable variations by natural selection. The elaboration of complications would thus result as a consequence of the evolved variations.

Prof Ward (*Psychology*, 1886) is responsible for the very ingenious theory criticised in this section The same view, alike in detail, is expressed by Wundt, *Psychologie*, 1893, ii, pp 507 17, also in Wundt's 1880 ed., pp 455 8, six years before the publication of Ward's Article in the *Encyclopaedia Britannica*.

104.—Interdependence and Interaction in Combining.

The problem of combinational sequence would be easy of solution if one bare image followed spontaneously another bare image, and that another, and so on. In such circumstances we could readily describe the evolution of a process of thought. The actual situation, however, is far more complex. Now one image develops out of its predecessor; now another puts us on our guard; and again the sensitising of one area has for its accompaniment the sensitising of half a dozen others to a more or less intimate degree. The entanglements to be considered are sometimes highly complicated. So also with the needs. While one leading need may more or less control the current of thought, it is yet at frequent intervals crossed by subsidiary or secondary needs Every bend in the stream of progress gives rise to a little eddy capable of considerable development The central need is like a farm bailiff who has a crowd of intelligent men to help him in the management and working of an estate. While each subordinate performs a particular task in his own way at any time, he is yet capable of performing others, even to the extent of playing a leading part, as, *e.g.*, in the bosom of his family. We may, without straining, carry the analogy much farther. (At bottom it is more than an analogy.) On the one hand, the bailiff is a complex product himself, almost entirely dependent on his environment. On the other, he would be paralysed if left to his own devices. His very existence presupposes the existence of others of his kind, and but for them his office would be an impossible one. To drop metaphor, a need can only be reasonably satisfied when the means to its satisfaction lie to hand. Secondary complications must be in readiness to twist the rope which shall haul the want towards its object. Without these subsidiary needs and complications, the need will fail to be satisfied, and this nearly always happens where there is a sensible departure between the present and any former need.

Let us analyse a simple instance. I say to myself "Have I seen that face before?" Here is a face, the ready apprehension of which is connected with a marginal feeling of familiarity. This first stage is the fruit of a curiosity which is ever developing *when circumstances are favourable*, and thus when we are not absorbed, the reading of a face will carry with it an attempt to connect it with something. Hence *B*, the marginal feeling, develops out of *A*, the seen face, the two forming one secondary complication. When, however, we are somewhat absorbed, the process is restricted and the marginal feeling does not develop. What we are specially bound to notice is that the seeing of a face results in a marginal feeling only under special circumstances; that this marginal feeling is secondarily connected; and that given the existence of *A*, *B* will find its explanation in that existence. As with *A* and *B*, so with *C*. The marginal feeling, under the conditions develops into the sentence we have quoted, and what is implied in it; and that, again, develops into a secondary attempt to reproduce what is pertinent. Thus, allowing for further complexities, we can see that the total process explains itself.

A more complex instance, like that of sending written information, is resolved in a similar manner. When the sensitising of one area produces the fainter sensitising of several others; when a word or a sentence is again and again examined and corrected; when notions of succinctness, clearness and completeness, assert themselves; when difficulties are reduced forcibly or by stratagem, when the wandering from the subject is resisted: in each case the connection is final and determined by the past. Each of the subsidiary needs and complications develop in the way common to them, and *only* to the extent necessary. Modifications there are many; but these are decided by the principles which we have insisted upon. Allowing, therefore, for a realm of needs where individual distinctions are as various as in a monarchy, the neural processes form their own explanation. It might perhaps be advisable to describe exhaustively some train of thought from this point of view; but the difficulties to be encountered would scarcely repay the sacrifices made. Best of all would it be if neurology were sufficiently advanced to enable us to lay bare a process of thought from beginning to end. Not until this has been accomplished, can we speak authoritatively of general facts of psychology.

105.—HISTORY OF THE SUBJECT.

From the beginning of speculation, thinkers have been impressed by the fact that some intimate relation exists between the more striking systems as they emerge one by one. Explanations like those of Aristotle and those of Hobbes naturally did not pass beyond the recognition that thought represented a cosmos and not a chaos. With the rise of the physical sciences, especially under the influence of Bacon and Descartes, the matter was inquired into more exhaustively. Locke's casual judgment concerning the Association of Ideas rose in general estimation, and was elaborated by Hartley into a vibratory theory, while Hume had already claimed that the Association theory was to psychology what the law of gravitation was to physics. Still, as the physical mode of inquiry took advantage of instruments and mathematical treatment, and as these did not seem applicable to the realm of thought, reflective scrutiny retained the field, though disguised by an outward sternness not its own. So comprehensive and simple did the laws of association appear, that thorough research was unfortunately discouraged, the completer formulation of the laws being the main concern of psychologists. This task was carried out to a high degree of perfection, but with little new light as regards the factors determining the flow of thought, by Brown, the two Mills, Bain and Spencer.

At the beginning of the nineteenth century the mathematical development of the physical sciences made a profound impression on many minds. As one legacy from that age we possess Herbart's system of psychology, which is a bold attempt to transfer the method of mathematical mechanics bodily to the secondary realm. His failure, however, was unavoidable, for, misled by speculation, he concluded that sense systems were not properly amenable to observation, and that the kingdom of knowledge could be forced by ingenious hypotheses. Herbart apparently did not see that the simplicity of physics was the result of centuries of arduous research (sec. 2).

Meanwhile the biological sciences were growing in importance. Hence we find a larger measure of acceptance accorded to Paulhan's theory of systematic association, a theory which argues that thought radiates from a centre and is controlled from there. Curiously enough Paulhan, like his predecessors, neglected to obtain the bulk of his material by a direct study of data, and he offers us, therefore, as regards the flow of thought, little of importance beyond his great leading conception.

The only rival to the Associationist school has been the metaphysico-psychological school, the best English representative of which is, perhaps, Dr. Ward. He recognises that the old metaphysics are unpalatable to the common mortal, and he strikes, therefore, a compromise. He starts with an unanalysable individual or subject to whom presentations are presented in an unanalysable way. These presentations give rise in an unanalysable manner to unanalysable feelings and these cause an unanalysable reaction in an unanalysable fashion. We have thus superfluous theorising of the usual type ruled out of court, the non-essentials of the structure, important in their way, being solemnly handed over for scientific treatment. We must nevertheless allow for two advantages gained, an exclusion of metaphysical discussion and an organic or teleological standpoint.

From our predecessors we adopt here the opinion that the process of thought presents a cosmos; that association is systematic; and that primary and secondary processes are teleologically determined. As regards method, we start from the position that the criticisms on the introspective method are markedly at fault (sec. 4). This granted, we are enabled to approach our facts in a critical mood. We endeavour, accordingly, to observe at first hand, most minutely, most widely and most repeatedly, varying the conditions until further variations prove barren of new facts Attempts must then be continually made to discredit any supposed conclusion postulated; to show that it proves too much, or too little or nothing at all. In a similar spirit any proposition arrived at must be systematically extended, to the uttermost limits of the universe if practicable. I claim for the method thus deliberately adopted the name of experimental, and I hold that it is a method which should be pursued in every class of research (sec. 9).

Our view, then, is throughout organic in conception and of an experimental character. The complex secondary world is to us a reflex of the complex primary world, and the origin and growth of the former a reflex of the origin and growth of the latter, though in the final analysis, as we shall see in sec. 176a, the body is but one complex object of existence. We also feel bound to reject the speculative theory of psycho-physical parallelism, owing to such facts as those of needs, attention and economisation (sec. 180). We prefer to believe that research will show matter and mind, the primary and secondary world, to be strictly one, parallelism being out of the question (sec. 180).

106.—A BIRD'S EYE VIEW.

Owing to the nature of the human structure, as determined by natural selection, needs tend to arise and to satisfy themselves, the method of their satisfaction being outlined in the inherited and adapted organism. Ideally speaking, given the need, full satisfaction should follow at once, in which case there would be but one step in every process. Since, however, the structure is imperfectly adjusted, the process of satisfaction or readjustment is frequently long, tortuous and unsuccessful, and *that more or less prolonged attempt at satisfaction or readjustment, embracing observation, memory, action and thought in every form, we call the process of* NEED SATISFYING REACTION.

CHAPTER V

SYSTEMS AS RE-DEVELOPED

As vibrations cease to be,
So our memories fade and flee.

107.—PRIMARY SYSTEMS IMPLY RE-DEVELOPMENT.

Walking along the streets at night my gaze fastens on the flame of a street-lamp. I see the transparent circular space immediately round the jet. I note the burning gas encircling this clear round space; I observe the silver colour of the light; and I gather that the flame, at its outer fringe, is in constant motion. I *know*, besides, that the gas presses out of the pipe, that chemical processes take place, that heat is evolved, and the like. At present, however, we are only interested in what is directly apprehended, and not in what is indirectly connected in thought with what we observe (sec. 15).

In ch. 2 we learnt that every reaction is the outcome of need stimulated attention, and that apart from the exercise of attention, colour, light, shape and objectivity are non-existent. We cannot, therefore, allow that we are ever passive when integrating anything. The system, be it a sight, a memory or a feeling, does not "present" itself to us; it is evolved with the assistance of bodily and environmental, or intra-organic and extra-organic, stimuli; it is membered (sec. 80). Considering the fact that we just stated, it is natural that a treatise on psychology should not open with a chapter on the senses,* for instead of primary systems, or sensations and perceptions being primitive, they depend on a variety of circumstances which, accordingly, must take precedence of them in a psychological discussion.

If my apprehension of a flame was impossible without attention of an advanced kind, then, by implication, another important factor participated. In ch. 3 it was shown that neural processes, like muscular activities, were affected by appropriate exercise. Hence my seeing a flame was not an event which related to the present only, for it depended to some extent on residual effects. To speak precisely, I re-attended, I recognised the object. In other words, re-development entered as one of the factors in the membering. [*Experiment.*] Had I never before seen a flame or any other object, nor ever met with anything, I should not have noticed the light. I should, metaphorically speaking, have passed it by. Indeed, were we fully absorbed or were the attention massed as in a desperate attempt at re-collection, no flame, no colour, no light, no shape, no motion would be apparent (sec. 14).

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* So James, *Psychology*, 1890, ch. 17.

Memory appears even in the simplest primary system in the form alluded to above. It also finds entrance by a different channel; for *every happening implies duration*—a lapse of many moments of time. [*Test.*] No system, consequently, exists exclusively in the now, each primary system being a time complex. If every element of a developed system instantly vanished out of the sky of existence like a flash, we should never meet a system as such. Besides, we should not obtain a lasting impression, for what is given would be disintegrated moment by moment. Indeed, as we have seen (sec. 19, third conclusion), every sensation or image is an after-effect.

Hume's psychology was delightfully simple, advanced though it was for his age. For him (*Inquiry*, 1748, sec. 2, and *Treatise*, 1738, bk. 1, part 1, sec. 1) there were, on the one hand, only impressions or forcible perceptions, such as are implied in hearing and seeing; and, on the other, ideas or feeble perceptions, such as are implied in re-membering a sight or sound. Thought meant for Hume the association of the feeble perceptions or ideas through their inherent relationships of contiguity, resemblance, and cause and effect. He recognised no organism adapted by natural selection for ready action in certain directions, and he also did not allow for the highly organised brain of the developed human adult. He did not notice that the visual or audile images were elaborate products surrounded by a variety of feelings equally complex, while he seemed unaware that these images were only insignificant portions of an extensive whole. Once we have learnt the complicated nature of the image, and the far more complicated environment with which it forms the idea or unit of thought, Hume's psychology, in this respect, becomes as mythical as are to us the gods of the Greek pantheon.

James Mill, and, to a great extent, Bain and Spencer remained true to Hume's naive classification. Most writers, however, have more or less left behind them the older view. Sully (*Human Mind*, 1892) sharply divides sensations, perceptions and images. He thus defines the first: "A sensation may in a manner be defined as a simple psychical phenomenon resulting from the stimulation of the peripheral extremity of the afferent nerve when this is propagated to the brain. . . Thus the stimulation of a point of the skin by pressure, or of the retina of the eye by light, gives rise to a sensation (1, p. 81). Simple sense reactions, however, he rightly argues, do not exist in the adult, nor, as I hold, in children. The normal minimum is a perception which he defines as follows: "The localising and the objectifying of sensation, make up together what we commonly understand by perception" (1, p. 207). That is to say, the immediately given sight or view of an orange is considered the sensation, while position, and the involved smell, weight and juiciness, together with the observed figure, are said to represent the percept. As we have seen in ch. 4, this mechanical method of explaining occurrences by arbitrarily stringing together a few selected systems is unwarranted, for in a percept or idea, or in a unit, we meet with a process which defies the application of notions derived from elementary mechanics. A large part of our total past, a sublimation of innumerable facts connected with oranges, our attitude towards fruit in particular and pleasure in general, all go to form the logical idea of an orange, while the actual idea is generally empty apart from a context. The smell, weight, position, etc., are only microscopic portions of what the developed idea presents us with. Again, "By an image," Sully says, "is meant the ideal copy or representation of the percept" (*ibid.*, i, p. 199). Here again I dissent. The image, surely, is a repetition of the sensation—of the empty idea, of the bare sensation—one of Hume's feeble impressions which tells us nothing without a setting or context (sec. 124). When, for instance, I think of a cherry in terms of sight, that image is no more a representation of the percept,—of what is connected with the sensation, with the bare sight,—than the sensed cherry of which this is a copy. *We may define an image as the complement of a sensation, and the word idea as expressing the total state when a number of connected images are present, image or re-integral being thus complementary to sensation or pre-integral, and idea or re-compound being complementary to percept or pre-compound.* Or to put it otherwise. A bare picture of a house with no interpretation put upon what is seen, is a sensation, or a pre-integral; that picture interpreted as useful, large or habitable, is a percept, or a pre-compound; the bare picture re-developed, is an image, or a re-integral, and the re-developed picture interpreted as useful, large or habitable, is an idea, or a re-compound. The stuff of which a particular sensation is built up may be termed an element, and a sensation may be regarded as a primitive percept. Or we may draw up the following scale, based on units of various degrees: element = unit of the first degree (u^1); sensation = unit of the second degree (u^2), percept = unit of the third degree (u), subcombination = unit of the fourth degree (u^4), and action or combination = unit of the fifth degree ( ).

James (*Psychology*, 1890, ch. 9 and other places) insists on the complexity of the reactive state. "Like a bird's life, 'thought' seems to be made of an alternation of flights and perchings. . . . The resting places [are] the 'substantive parts,' and the places of flight the 'transitive parts' of the stream of thought" (*ibid.*, i, p. 243). He also says that "sensation . . . differs from perception only in the extreme simplicity of its object or content" (*ibid.*, ii, pp. 1 2). In fact, the difference between the highest and the lowest product is one of degree, the simplest sensation equally with the most comprehensive combination being an organic outcome, while psychic functioning must not be interpreted in the light of a mechanical or chemical method, for its conditions are its own, those of the implied complication. No process such as fusion (Hoffding and Binet), assimilation (Wundt, Sully and others), complication (Ward, Stout and others), mental chemistry (J. S. Mill), yields more than a hint of what is a simple and peculiar result of economisation. Neural feelings such as are involved in doubt or belief are no more likely to make neural changes intelligible than muscular feelings make muscular changes intelligible. Prof. Ward (*Psychology*, 1886, p. 57, col. 2) distinguishes sharply between sensation and representation, saying "whereas there can be a mere sensation red . . . we can only have an image or representation of a red thing or a red form," to which the reply is that every system, however simple, is equally need-created, and, therefore, has equally thinghood or formhood, and that corresponding to the "mere sensation red" there is a "mere image red."

See for definition of terms, Lewes, *What is Sensation?* 1876; Turner, *The Senses in a Course of Psychology*, 1889; and Davidson, *Definition of Sensation*, 1881. Herbart speaks of sensations as "those simple presentations which are called sensations [Empfindungen] when we wish to point to the moment of their first appearance" (*Psychologie*, ii, 1831, p. 52), and a presentation is to him the rebound of the soul when disturbed (*ibid.*, ii, p. 470). As to sensations, see also ii, 102, of the quoted work, and Souriau, *Les Sensations et les Perceptions*, 1883; Bonatelli, *Les Sensations et les Perceptions*, 1884; Meinong, *Ueber Begriff und Eigenschaften der Empfindung*, 1888-9; Payot, *Comment la Sensation Devient Idée*, 1891; and Scripture, *Zur Definition einer Vorstellung*, 1891.

It will be evident from our analysis that we cannot examine an object bare of details for more than a microscopic period without the attention wandering. [*Test.*] Usually, therefore, because it occupies time, or for more serious reasons, we take account of a variety of fresh details. Yet we never do, or can, attend to an object to the extent of exhausting its meaning.

Brentano, and with him Stout and others, are at pains to distinguish between the object as thought-of and the object itself. Psychologically the distinction is illusory. The world, to the psychologist, I take it, is one, the object and the object-as-thought of being indistinguishable theoretically. To identify a smell as pointing to an object, say, an orange, is to infer a complex of which the smell is one expression. This I shall attempt to substantiate in ch. 8. The object-as-thought-of is thus a *partially exhausted* system and the object-itself a system regarded as *wholly exhausted.*

In the instance cited, *i.e.* of the flame, we have, of course, consecutive development, and of this we may now speak.

108.—THE PERSISTENCE OF NEURAL MODIFICATIONS.

While staying in Paris I visit the Louvre, and among the art treasures there I notice the Venus of Milo. Just to glance at the statue would be insufficient, for much would escape me. I, therefore, approach the figure. My eyes swing repeatedly in various curves to drink in the pose, the proportions, the outlines, the detail and the conception. In accordance with the interest aroused by any feature, so do I examine it or recur to it. Some considerable time is occupied by my scrutiny of the masterpiece. If, on moving away from it, I were asked for a full description of what I had observed, I should be able to re-produce pretty nearly all that I had membered. Probably little would have been forgotten. [*Test the fulness of memory for short periods of seconds and minutes.*]

Let us be more precise. After one minute's experimental thought several dozen details are re-developed which were taken account of during that short time (sec. 219). An argument occupying no longer a period, is in this way re-developed almost completely, and only the organic feelings, the setting of our images and the exact language employed, are omitted. Again, one day, about 4.30 p.m., I begin to be engaged in a conversation lasting about twenty minutes. [*Take notes, after the event, of such a conversation.*] As we converse, I put down single words, forty-three in all, to represent the headings of the talk. At 9 p.m., I start writing,—not having thought of the conversation in the meantime,- and finish about 11 p.m. Almost the whole body of matter is re-membered—on 240 details, though perhaps every single detail of that conversation would have been forgotten in the ordinary course during a twelvemonth. Again, during the day I have been reading with constant interruptions *Henry VIII.* I started reading about 10 a.m., and finished about 6 p.m. At 8 p.m. it occurs to me to test how much of the play I am able to recognise as familiar. I look at many hundred lines here and there, and notice that nearly every line has a homely ring. Yet probably I had read that very play years previously, and cannot re-develop a single line, leaving aside often-quoted passages. [*Imitate this experiment.*]

Memories continue faithful and complete for some time. Were that not so, intelligence would cease. This persistence alone enables us to observe objects, such as landscapes, palaces and streets, or to study closely what is minute. If the view of an instant ago disappeared immediately, we could not lucidly apprehend anything. As it is, for a certain short period after an event is past, we can remember what happens to us with almost absolute fidelity.

A melody exists in time and is not inordinately long: one which lasted a whole day could not be understood. So also the notes of a melody are not far removed from one another; for if these occurred at intervals of ten minutes, it would be hard to detect a system in music or to appreciate it. As the matter stands, the musical notes follow each other closely, yet not too closely, and the theme is not unduly prolonged. Hence, since the parts are well re-developed, the melody is easily grasped. If each note ceased to exist as soon as it was heard, the meaning of a melody would be unknown to us. If the reverberation subsided quickly, only melodies of the shortest range could be apprehended.

We must here guard against a possible misunderstanding. Bound as we are to employ the language of common life, it might be thought that the various notes—the sound systems—persisted until the last one reached our ears. Such is not the meaning intended in the preceding paragraph. We rather mean that something reverberates which represents the notes. When we are listening to music and examine ourselves from moment to moment [*you should do this*] we find no notes there except those we are actually hearing. What we discover, are feelings which had accompanied them and which persist. Note after note seems to affect the feelings, and each succeeding feeling modifies its predecessor. In this way a melody is understood as a whole. [*This should also be determined physiologically.*] The music does not lie wrapt up in the notes, but in the successive feelings which these awaken. The former owe their importance solely to the feelings by which they are accompanied. At the same time, either a repetition of the note in some form, or a partially identical feeling is normally essential to the re-awakening of the accompanying feelings. Seeing a certain person in the street, a certain feeling of this nature develops, as a result of which I organically try to think of some one who had aroused in me a like feeling; or, as sometimes happens, the feeling—the summary feeling—stands by itself and is not followed by any image. [*Examine such instances.*] As we have learnt in the previous chapters, this feeling varies indefinitely as to quality, and thus one secondary sight system seems to be developed directly by another. Hence, in the creation of metaphor the partial identity in the summary feelings is much closer than the connected sight systems or images which are frequently most disparate. In moods and in neural excitement it is equally observable that a feeling can be indifferently followed by a related feeling or by a secondary audile, visual or other system. [*Test this.*] It is, therefore, to be noted that feelings are not *retained* by images, as lawyers might be by their clients. Of course, in the last resort the relation between successive primary or secondary systems of every type is best determined neurally.

What is asserted of music holds generally. Series of sights and sounds are not as easily re-developed in completeness, as are the summary feelings which follow them. Similarly, structural elaboration does not take place among the products of the five senses, since these products do not admit of ready synthetic treatment. For the present this brief reference as to the place of feelings must suffice.

A feeling, such as that of hunger or thirst, as Paulhan says, may occur repeatedly without being aroused by a similar past feeling. So also the peculiar impression which similar persons often make upon us is a primary fact and not necessarily connected with similar facts in the past. Once the feeling exists, we organically re-integrate perhaps a face which had at some former time aroused a similar feeling. In cases where the feeling is frequently developed, it may lead to the development of similar feelings or images. It is a common opinion that feelings are re-producible by images, but that they cannot re-produce images or other feelings (sec. 71). Thus, for instance, Hoffding tells us that "feelings are remembered by means of the ideas [*] with which they were originally linked" (*Psychology*, 1891, p. 241). Nay, he goes further, for he argues that "it is easier to recall images than the feelings which accompanied them" (*ibid*, p. 241).

The intelligent grip of any conversation, argument or speech, depends on the relative persistence of neural modifications, and in the absence of such persistence a speech would have to consist of a solitary syllable or letter. It is on this trustworthiness of the memory that we rely in conversation. The reasoner would be confounded if he were uncertain of the drift of an argument, and the debater would be at a loss to read his notes or to answer his opponent.

Normal development takes place in time. We are, consequently, dependent on our memory. If immediately after asserting that "normal development takes place in time," I forgot what I had uttered, or grew doubtful, coherent thought would become impossible. As I am at the present instant writing, I re-develop from moment to moment sentences without any notable effort and without ceasing to write or to think. If it were otherwise, no one could even set down on paper a closely reasoned argument, for the attention would be skipping like a stone hurrying down a sharp incline, or it would be moving hither and thither like a helpless shuttlecock at the mercy of eager players.

Every kind of development presupposes a memory which for short periods is almost mechanically correct. What would happen if re-development were either flawless throughout or never trustworthy, may be left to the imagination of the reader.

109.—NEURAL EXCITEMENT.

There are few persons who have never lost their equanimity and the surface of whose soul has never been ruffled. In speaking, then, of anger we refer to no uncommon fact. It is nevertheless not every aspect of this fact which we wish to analyse, but only one. When on a sudden we are violently agitated, as is a river on the launching of a vessel, it is no easy task to allay the agitation. Last Sunday you were seriously annoyed. A friend did not keep an appointment, and you were walking up and down in the rain waiting for him for an eternity, as it seemed. Notwithstanding your annoyance, you did not give vent to your feelings. You considered that it was idle to fret. Being in an experimental mood, you endeavoured not to be irate. All in vain! One set of moody thoughts was scarcely dismissed before another set developed. The cheerful prospect which you fixed on was dominated by a sullen gloom. Perhaps it took several hours, or a day or two, to re-establish your reputation for serenity. For this reason, just as the effect of dropping a stone into a well leaves the surface blurred for a measurable time after the object is buried in the soft bottom, so excitement survives the factors which produced it. Thus anger, once aroused, is not readily calmed. For hours it sometimes haunts us, and will not yield either to persuasion or to a command. We assure ourselves repeatedly that there is no occasion for being angry, but yet we are ridden by a fiend.

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[*] Here the idea is considered as a visual or auditory image in Hume's sense. I hold, on the contrary, that a visual image, like a visual sensation, has meaning only in proportion to the greatness of the universe of thought with which it is connected. I may, for instance, member a visual system, without knowing whether it is observed, imagined or re-produced, or whether it represents a painting once seen or a past event (sec. 124). Yet even here the idea forms part of a larger system. See also Titchener, *Affective Memory*, 1895, and *Affective Attention*, 1894; Ribot, *La Mémoire Affective*, 1894; and Paulhan, *Les Phénomènes Affectifs*, 1885.

The feeling of anger is not the only wave which thus tends to propagate itself, for our notions correspond with the mood we are in. The thoughts in a mean mood are accordingly disagreeable, carping and critical. If we are weak-minded, these sickly imaginings persist in swaying us until the last echo of our wrath is overtaken by silence. Perhaps the condition is prolonged even beyond that stage till, suddenly, as with a young child, a warm sunshine thought dissolves the mists. We observe also that as bright thoughts momentarily prevail, so the tempest is in abeyance.

Anger is a mood, and what we affirmed of it, holds of moods in general. Have we not sometimes felt so buoyant that we could not resist the temptation of jesting at death? Or so morbid that trifles have made us despondent? Or so sane that we could defiantly re-integrate and frigidly scrutinise what normally would make us tremble?

Anger is a mood, and what is that? How far must we be stirred before we dare suspect its presence? I venture to reply that there is no line of demarcation. Every state that we are in shows symptoms of it. Everything, however trivial, affects us, and gives rise to a mood. Every percept or idea has its halo of persistent feelings (sec. 140), feelings which are the equivalent of neural excitement or a mood.

Four statements at least are deducible from the proposition that combinations, in one of their aspects, are universes of moods. First, every line of thought or action is swathed in a mood, as referred to in sec. 149. Secondly, every mood persists for a longer or shorter period. Thirdly, each mood is accompanied by topics or details congenial to it; and fourthly, every mood, for a time, resists dismemberment, tends to recur when dismissed, and re-develops when the attention otherwise flags.*

110.—SUDDEN RE-COLLECTION.

Armed with these generalisations, we will attempt the solution of a special group of memory problems. Let us, for this purpose, re-analyse an occurrence of this order (sec. 43). I try to re-develop the second verse of a poem with which I am acquainted. After repeated and vain endeavours, coming back again and again to the subject, I turn my attention to something else. Suddenly, in the midst of some evolving notion, the lines rise mechanically, like a cork released under water. What explains this sudden re-appearance? Was there anything which dragged these to the surface, or were they, with malice intent, re-developed? Both these explanations must be dismissed in view of the principles which have just been enunciated. We are forced to believe that the neural excitement continues, though the feeling stage exhibits no appreciable proof of such continuance; that the process of searching for the lines persists neurally; and that the sensitive area does not completely regain its equipoise. [*Study experimentally.*]

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* "*Mood*, that is a sum of relatively permanent organic modifications colouring the tone of mind" (Sully, *Human Mind*, 1892, ii, p. 58).

Consider another instance. I have an engagement for a certain hour, and I am anxious to keep it. Repeatedly during the day the fact is re-developed. Occasionally it happens, of course, that one thing or another suggests the engagement; but, generally, re-collection by development or association, not directly traceable to the surviving excitement, is exceptional. As far as the current of thought is concerned the notion of the engagement is re-integrated spontaneously. The neural sensitiveness has not departed. [*Observe when making engagements, and test spontaneity.*]

Often a tune haunts us. It matters not whether we have any objection to it or not. If we have none, our whole day's thought is interlaced with that tune, and were we to observe the texture of systems under these conditions, we should find that the tune inserts its threads arbitrarily. We should discover that no idea or combination maintained its unity long. We are not, however, in a better condition, if we do object; for, in spite of our defiant attitude, we remain helpless. The tune comes and goes, and the precious minutes run to waste. If we are wise, we become reconciled to our fate. [*Watch such events minutely.*]

Take another example. For an hour or so I have carried on an animated discussion with a few friends. I leave them because I have to prepare a lecture. Yet, though I am bent on nothing but my task, I am persistently interrupted by irrevelant thoughts traceable to the discussion. More than an hour passes before I can settle down to my work. Meanwhile, argument after argument is re-incarnated or suggests itself, point after point is weighed, while I am ostensibly attending in a direction unrelated to the discussion. Many a subtle aspect which was overlooked, many a fallacious inference, many a striking reply, startles me, as if an irresponsible phonograph were at my side, and casually broke in upon me. It should be noted that *the momentum given to the topic is slow in exhausting itself*; and also that the whole of the thought process is not equally reflected on the mirror of the immediate present. [*Test such a case.*]

Again, I am learning shorthand. Wherever I go—though I have dismissed the subject more than once with a gruff Amen and without a blessing—every sign over a shop, every out-of-the-way term which rises in the course of thought deflects the stream of attention, and I begin to test the words phonetically. Apart from a sensitised brain area this fact is meaningless. Why should a sign-board suggest shorthand questions when there are oceans between my passing thought and that subject? Why should combinations be repeatedly bisected by irrelevant propositions? [*Note such cases and also induce them experimentally.*]

We have reviewed a batch of occurrences which, though not uncommon, cannot be said to abound. Another category of instances is often met with. I am to ask Z. a certain question when I see him; I am to call at such and such a bank; I am to verify a certain passage; or I am to rise half-an-hour earlier. In many of these cases complication or association is a seeming force, for seeing one object I re-member another; but why, for instance, should the entrance to a certain bank suggest to me that I am to call there? The reply must be that the mood persisted, and that the physical area was still highly sensitive. We should quickly notice the difference if that were otherwise. [*Analyse such cases.*]

110a.—THE NATURE OF RECENCY.

The fact of recency and sustained attention finds its explanation in neural excitement. Bain casually refers to the nature of recency: "It is a primary law of all impressions whatsoever, that, for some time after they are first made, they come back readily to the consciousness, even without an express associating link. . . . All this is perpetually exemplified in the recollections involved in our everyday transactions" (*Senses and Intellect*, 1894, p. 589). An extreme illustration is to be found in the fact that owing to the slow fading of sensations, we have apparently no sense of darkness when shutting our eyelids in the ordinary course, not even when we deliberately experiment. What is more, the eyelids may be shut for a considerable fraction of time, and still no darkness be perceived, the image persisting vividly while the eye is closed and thus spanning the interval of no-vision. (See also Child, *Statistics of Unconscious Cerebration*, 1892.) Brown (*Lectures*, 1824, ii, p. 376) ingeniously suggests the following explanation: "When we sit down to compose, the thought of our subject is soon associated with every object around us,—with all that we see,—with every permanent sound,—with the touch of the pen or the pencil which we hold,—with our very tactual or muscular feelings as we sit." Experiment corroborates Brown to a very slight extent; but his contention proves far too much.

The precise nature of the recency factor is not easily determined. I shall, however, attempt here an analysis of the factors which enter into the problem before us. (1) All that is barely attended to—and in this we must also include the various feelings which most persistently accompany the processes of seeing, hearing, touching, thinking, acting, etc., as well as the outer margin of any sensations, etc.—is forgotten almost at once, is difficult to re-develop, and hard to recognise. That which does not fall near the focus of interest has an equally ephemeral existence. (2) An event may powerfully impress us. We may, for instance, have been so frightened that the heart is almost still and the whole body is violently affected. Here the effect will naturally last beyond the moment of fright, and the equilibrium will be slow in returning. (3) As we shall see (sec. 134) what is exciting may be inhibited by abruptly turning the attention away or by a new and strong interest diverting the trend of thought. In these instances, what would otherwise powerfully appeal to us for some continuous period, is soon disintegrated. (4) What has been stated in the two preceding sentences suggests that *facilitation*, which is the opposite of ***inhibition***, may be a factor in recency. That is to say, instead of a topic being sharply dis-integrated, we may linger over it and only half-heartedly leave it as new objects appeal to us. In an obvious case of this kind, we only confusedly attend to what is more recent, for some of the attention is still absorbed in what has previously passed. This suggests that (5) ***the persistence of what is recent may be to all intents and purposes an acquired habit*** *or a complication.* According to this interpretation we, perhaps, generally dwell on what is recent, while we only partially allow the attention to stray into new fields. From this it would follow that much at least of what has recently occurred, recurs with seeming spontaneity because it has never properly been outside the field of attention. When we thus wish to be able to re-develop a certain fact for a short time, we only imperfectly readjust the attention, facilitating in this way an easy response when occasion offers. A large portion of recency, as for instance recurrence to a topic after an interruption, may therefore be said to exemplify the particular acquired habit of only partially dis-integrating what has very recently occurred, and this habit is encouraged by the nature of the organism. (6) What is recent, apart from the fact that immediate obliviscence is not uncommon, has by no means always the advantage over what has passed long ago. Already in sec. 60 we have seen how easily an established trend triumphs over a recent resolution. The fact is that what we have known well for a long time offers a positive obstacle to the learning of what is recent. Old notions, old incidents, old habits, old sympathies, can, therefore, with difficulty be supplanted by new ones, and are more readily re-developed than the new ones. To illustrate, I spent two days sight seeing in a certain town, and for ten years used to recur to the sights I had seen there. After this period I visited the town again--for eight days this time—and yet the recent views failed to leave a lasting impression. Indeed, *the life of thought has regard to established interests and knows naught of barriers of time.* [*Test this paragraph.*]

The nature of recency is thus more complex than might at first be assumed.

111.—NEURAL EXCITEMENT IMPLIES NEURAL MOMENTUM.

The subject of excitement which we are investigating is by no means composed only of exceptions. These are mere outposts, conspicuous because they are removed from the main body. They point to the army of common facts. A horse is running in a race; by degrees the pace increases, until, trying all the way, he reaches his utmost speed. Though there is no economic reason why he should not stop suddenly at the winning post, he yet is not pulled up till he is some distance past it. We readily see that once the judge's box is passed, the momentum has no positive value; yet in its absence the race could not have been run. The momentum persisted throughout, though we only became aware of its existence when the horse whirled beyond the post. Thus *the momentum is an essential component in the argument, the seeking for the verse, and the thinking about shorthand.* In serious labour this is conspicuous: while in other tasks it has its part to play. We only learn of its presence, as far as the race is concerned, when the horse does not come to a stand-still at once; and so, this fact, in connection with systems of thought, is only made patent when we act in opposition. *In this impulsive manner we become and remain absorbed in a subject or alive to an issue. One pale copy of a system does not drag after it another chained to itself; we meet rather with a little universe in labour.* The memberings are the result of considerable efforts, varied and manifold. The force of the momentum, by the way, is well studied in such an instance as that referred to in sec. 109, where the contents of a whole book are recognised as familiar: in such cases memory is most complete. [*Verify in your own life.*]

We have seen that what has just happened can be minutely re-produced for a short time. For this reason even inconsiderable interests readily attract us for some hours. In an average person's life few days pass without some excitement which tends to be spontaneously re-instated during the hour or day. A battle has been fought, a speech has been delivered, a storm has caused disasters, a friend is ill, an interesting letter has been received, a peculiar notion has struck us, and so on; or else business, the family or amusements, form the staple of thought. After several months most of these incidents are re-developed with great difficulty; after several years a ragged remnant only survives. Yet not only does almost everything suggest the interesting call we made an hour ago; but parts of the incident are re-instated spontaneously when we are not otherwise engaged or when, for instance, we meet a friend. [*Test.*]

The bulk of our thought, then, apart from the business of life and our more or less permanent interests, revolves naturally around the casual events of the hour. [*Does it?*] This time-table of thought is not without its advantages, for to examine an object in all its bearings is only possible when we have it before us in something like its entirety. Hence it is best studied when re-development is practically complete. To put off our investigation to some future time is dangerous, since we shall find our memory to have shrunk surprisingly. We can, therefore, best whet our intellectual tusks by an analysis of the present. Subject after subject, as it springs up, is in this way examined and disposed of, and what is precious is abstracted from its veins. If, in addition, we consider that permanent interests and dispositions are by the nature of their constancy fresh and active, we gather that the mass of thought groups itself round the immediate present, and that the past and the future only enter as occasional visitors. In this wise our needs, in fulfilling themselves, follow the lines of least resistance. The omnipresence of neural excitement and momentum seems, therefore, proved.

If we experiment, we receive confirmation of the above views. Allowing the memory to take care of itself, detail after detail appertaining to the immediate past is re-integrated, while that which is far off in time can only be re-produced, as a rule, by means of casual suggestions (sec. 152). If I watch my normal thought, I observe that while what has passed very recently is readily suggested by every topic and is frequently recurred to spontaneously, particular events in the far past, which have not been recently re-collected, lack both these characteristics almost absolutely. Everybody can test the truth of these statements for himself. To prevent prejudice he may also experiment with the purpose of showing that recent occurrences and recent memories do not possess the powers here assigned to them, and that far-off ones do.

To sum up, one aspect of every combination is a mood or a neural excitement, and as such it persists for some time after its inciting stimuli are removed and is accompanied by appropriate thoughts and actions.

112 MEMORY SLOWLY FADES*

Uttering "Let me see," with the purpose of repeating the three words directly afterwards, I re-develop the brief phrase unfailingly, and I am convinced that I have recollected rightly. It is not so when a day, a week or a month have elapsed The curve of re-development inevitably dips though its descent is gradual

Prof Lloyd Morgan (*Comparative Psychology*, 1894, p 73) pertinently remarks "We may try to establish the sequence *[illegible]*, or seven times eight fifty-six in a small boy's mind so that at the end of the lesson *[illegible]* at once suggests *[illegible]*, and the multiplication table runs smoothly. But next week *[illegible]* unfortunately does not suggest *[illegible]*, and the multiplication table is decidedly lumpy" In learning a sentence by heart experimentally, I notice that if at first I let a few seconds intervene, the words are forgotten Later on, if I persevere, I can redevelop the sentence haltingly—by making a sensible effort, word by word and without feeling certain that I am correct [illegible] less effort is required [illegible] and I have more confidence in my correctness At last [illegible] constantly saying it, although far from doing so every [illegible] with it Then, the occasion for developing the sentence [illegible] process sets in until I do not [illegible] the sentence even when [illegible] When [illegible] intervals of, say, three months [illegible] divide activities, I find the [illegible] forgetfulness is constant [*Learn the following by heart* "*The use of this [illegible] involves risk of injury [illegible] and is prohibited and [illegible] and forgetting, [illegible] words in the [illegible]*"]

We shall see how much is reinstatable of one minute's thought immediately after the event (see 210), and we have learnt the quantity that can be remembered within a few hours (see 195) Selecting a somewhat eventful day [*the student should repeat this*] and noting down the following day at 8 p m what I recollect of it, it being understood that the day had been selected after it had passed I find that 750 items are reintegrated with ease. After a year I should normally be unable to press into service more than a few of these details [*This experiment should be varied*]

Reading a book on metallurgy, I notice that many unknown words are beginning to sound familiar I can readily remember several scores Some of the definitions which are frequently alluded to in the book, I no sooner desire to redevelop than they spring with a bound into existence as if they had been expressly waiting for such recall So unfailingly does redevelopment take place that, try as I may, I find it impossible to believe that I shall ever forget the special nomenclature and definitions, and this in spite of the fact that I have on other occasions had the same feeling and yet lost every particle of what I considered a possession forged about my soul

The book is read and done with, and it is put on one side. A day or two passes, and still I remember apparently everything. A week runs its course, and there is some diminution in my accumulated stock Five or six weeks elapse, and I am only able to re-develop the general outlines of

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[*] "The records of memory, like trees and fungi, are subject to growth and decay" (Verdon, *Forgetfulness*, 1877, p. 441).

the subject together with the more prominent landmarks. The notion of the permanent fulness of a large reservoir of knowledge, unaffected by the heat of other interests or the wind of oblivion has proved erroneous.

For a short period of a few weeks much may be re-developed. The specific gravity of a variety of substances, the specific heat of various bodies, the reaction times of psycho-physics, the mortality rates of towns, and a considerable assortment of other statistics, are taken to constitute a lasting fund of information when it is in reality only a temporary one. For weeks the figures are repeated daily, and yet, after ceasing to refer to them for a few months, our caged bird of knowledge has probably taken wings. [*Deliberately learn sets of figures and letters, and watch the process of forgetting.*]

For the average man to make sure that a topic will not slip away from him, he must remain on close terms with it for some months, perhaps some years. He must court occasions when he may revert to it. If he does not do so, he loses what he has laboriously acquired. Re development does not depend only on re-instating a fact a stated number of times. The repetitions, for reasons which we shall learn below (sec. 134), must spread over a considerable period.

Of late I had occasion to learn a phonetic alphabet. In asking myself what is the equivalent character for *h*, the reply would come smartly, the reason being that while the question was evolving, the answer was already shaping itself. It was otherwise when I wished to write a whole word, such as "standard." Each letter took an appreciable time before it presented itself, and the result was dreary slowness. Practice must, therefore, proceed for a prolonged period, before the swiftness of re-development satisfies common wants. What is true of writing is truer still of reading, as when a practised reader reads over 250 words in one minute.* Nevertheless the membering of a word, even with the expert, occupies sensible time. For example, travelling in a train, I in vain attempt to decipher the names of the stations as we rush through them; while in a railway journey by night the sparks from the engine appear as glowing wires.

113.—CRAMMING.

We can now understand the danger of cramming. Some weeks before an examination a pupil learns by heart a multitude of facts, words, statements and definitions. Such morsels of learning as are difficult to digest, he is made to assimilate temporarily by a liberal diet of stimulating examples. The day of judgment arrives, and he acquits himself honourably. His knowledge as well as his comprehension appear unexceptionable; his relatives and friends congratulate him; and yet, after a few slow months, one would hardly believe that Master X. had passed the ordeal. Learning never made a home for itself in his neurons. Cramming is hence indefensible. Were it not that examiners are fully alive to its pernicious effects, and model their papers on a plan which tends to defeat cramming, we should meet with little scholarship outside the examination room. The inspection of the learner's ordinary work is a well known safeguard against illusive progress.

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* In 6¾ hours I read a quantity of matter, equal to a rate of 189 words per minute.

There is another side to the subject. "Wherever the matter acquired is merely of temporary interest the power of casting off is a clear advantage" (Sully, *Human Mind*, 1892, i, p. 350). Jevons (*Cram*, 1877) examines the question in a somewhat heated manner, distinguishing good *cram* from bad *cram*, a legitimate distinction. Verdon says: "Our memories are like gardens, and the richer they are the more they require weeding" (*On Forgetfulness*, 1877, p. 451). However, granting a well acting memory, and there is no reason why any acquisition should require weeding out.

114.—WE FORGET MOST THINGS.

Prof. Lloyd Morgan (*Comparative Psychology*, 1894, p. 73) concisely sums up individual differences in memory when he says: "Macaulay could not help re-membering; most of us cannot help forgetting."[*] To retain to some extent an intellectual possession, months and years are necessary as a rule; but when we are once grounded in a subject it is easily re-developed and runs little risk of being consumed by the rust of time. Here are some extreme examples. Tasting a dish we were accustomed to twelve years ago and have not apparently touched since, we appear to be thrown back in time. Or we have been away from the country of our birth for ten years, and have not spoken many hundred words in our native tongue for most of that period. We seem unable to form a genuine sentence; but we return home, we hear the familiar tones, and, after a day or two's practice, we speak almost fluently. Or many years have passed since a man has been engaged in a certain occupation. He is compelled to return to it, and after a few weeks the fallow years seem but as days. The broad river of time is cleared in such cases at one bound. [*The matter of this paragraph should be tested by the student, where possible.*]

So much to the credit side of the memory account. The debit side is in a seriously unsatisfactory condition. If we ask a number of persons [*you should do this*] as to their earliest re-collections,[†] we are surprised to find how very little they are able to re-produce. Collecting my own re-membered store between the ages of 0 and 9 years, and allowing liberally for omissions, my treasure reaches the low figure of one hundred re-collections.[‡] Judging from inquiries, this estimate appears to fit the general run of human beings. The figure 100 will cover also in my case [*will it in yours?*] the age from 9 to 12; but I expect that my retentive powers are in this instance considerably below the average. Still, there is no reason to imagine that the figure should be more than quadrupled. From 12 to 20, omitting two journeys, I gather 2000 re-collections [*how many do you gather?*] this being again a generous estimate. I suggest that average persons of thirty-four years of age do not re-member much more of the above periods. A pedestrian tour, undertaken about the age of 19, which extended to Austria, Germany, France and Denmark, and lasted about seven months, yields 700 details. A second tour, a year later, extending to Austria, Italy, Switzerland and France, and lasting three months, yields the same figure, 700.

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[*] For remarkable memories, see Biervliet, *La Mémoire*, 1902, pp. 52-6; Hamilton, *Metaphysics*, 1877, ii, pp. 224-6; and Henkle, *Remarkable Cases of Memory*, 1871.

[†] V. and C. Henri, *Premiers Souvenirs*, 1896; Bourdon, *Influence de l'Age sur la Mémoire Immédiate*, 1894; and Colegrove, *Individual Memories*, 1899.

[‡] I omit in my conception of "re-collections" such knowledge as is implied in the words and phrases I learnt, and in the muscular and neural dexterity I acquired.

Thus the first 20 years of my life bring about 3600 sheaves into the garner of my memory; 20 to 25, which were years rich in varied opportunities, yield 2000 more; and another 9 years, less suggestive in their history, probably 4000 more, omitting the last twelve months up to the time of writing. This swells the number of floating re-collections between 0 and 34 to about 10,000, allowing for omissions. A somewhat Bohemian life is thus numerically summed up in what may be lived through in half-a-day. In other words, I am able to re-develop about one 10,000th of what happened to me, though it must be admitted that a quantitative statement is not wholly satisfactory. Moreover, the re-developed systems of the first nine years do not cover more than the space of a minute's activity, and could be re-developed during that short interval; and if we apportion ten hours of waking existence to a day, I do not produce one 250,000th part of what happened to me during the above-mentioned period. The facts on which the calculations are based, I may mention, were carefully collected, sifted and tested. The records for the first 25 years do not depend on averages of any kind, but on lists drawn up systematically and supplemented by the occasional additions of at first unrecorded facts.

Let me give an illustration as to my meaning of point or detail. When at Torquay I went (1) to Tottness (2) by rail; (3) I have a glimpse of my arrival (4) and another of part of my walk; (5) I see the pier; (6) we are going down the Dart by boat; (7) now the river seems to become narrow; (8) now I see the hills; (9) the river is frequently narrow; (10) I have pointed out to me (11) a barn (12) where some voters were forcibly retained, (13) through which the borough lost its voting rights; (14) we see Raleigh's house, etc., etc. From this example it is plain that the number of details—since even the simplest sensation is a complex—depends on not quite a satisfactory definition of what a detail means, and that each inquirer must supply illustrations of his method. The mode of numerical entry which I adopted was as follows. To represent 1 to 9 I used slight horizontal strokes, and slight strokes slanting from right to left and left to right, three positions for each stroke. In the tens I omitted the zeros. Each item was usually represented by one word only; and, when practicable, as when re-collecting the shops in one road, I employed only the strokes without the word. In collecting my material I placed myself at some chronological point, and followed closely every line of suggestion to the end, thus covering a period as with a network. At the same time I kept notes of details which I re-membered after completing the list. Ordinarily I also left a margin, from one to twenty and more, according to the importance of the events in question. *The student, with these suggestions to assist him, should epitomise his own life, tracing the factors in memory. He might also determine the proportion and nature of visual, audile and other images, including feelings.*

The relative quantity which an average individual re-members is paltry, and only in very few instances—so few that they need scarcely be considered—is the far past capable of being re-instated without the assistance of repeated memorising. This can be tested by every-day occurrences. For example, I lose the manuscript of a chapter of this book. I am greatly interested in its recovery; but for several months the mode of its disappearance remains a mystery to me. Time and again I make efforts to re-member where it was lost, and at last some one finds the manuscript. Do I even now re-collect the occasion? Not in the slightest. Again, I am about to re-read a certain play of Shakespeare's which, by the notes in the margins, I indirectly know I have read, and which I saw acted about six years ago. I carefully write down what I am able to re-develop of its contents: about a dozen details cover the ground. I now read the play, and observe that not a single additional detail is recovered. [*Repeat the experiment.*] It would be tedious to marshal further illustrations, and my observation of others agrees completely with what these two instances reveal. The mass of what is forgotten is irretrievably lost—no agonising want and no abnormal condition brings it back. There is also evidence to show that old men do not re-develop fresh details about their youth [*ask aged persons what they re-member of their youth*], and that in dreams, in delirium and in drowning it is unlikely that we re-produce what has not been re-developed for years—incautiously repeated tales notwithstanding. [*Ask children about their earliest re-collections.*]

It may be objected that, on my own showing, several thousand items are re-developed which date back many years. In these cases the memories are not as hoary with age as they appear to be. It is true that they refer to twenty or thirty years ago; but they have been re-integrated since at various times. *Only in so far as systems pass through the mill of time repeatedly, do they survive long periods.* For instance, a disastrous fire at a public resort calls up with me invariably a burnt-down theatre which I had seen, and thus alone is that sight preserved. Similarly with the totality of what is re-developed: as certain details are sensed, or thought about, so certain less recent ones are re-developed. Of course, some things are re-produced much more frequently than others, perhaps every two months, while others are re-developed not oftener than once in two years. A longer interval tends, I believe, to wipe out the traces altogether. Once, for instance, that a melody which interests us is heard, we repeat it frequently for a few weeks or months; then the intervals of re-collection gradually widen till re-instatement becomes difficult and at last impossible. If, on the other hand, a series of melodies interests us in succession, we dwell little on each, and melody after melody is rapidly forgotten. So with all our memories. They are first formed, then frequently rehearsed, then the intervals of rehearsal grow wider, then the images become indistinct, and at last they sink into oblivion.

Faces of old times, and distant events generally, are frequently, but unostentatiously, re-developed in connection with like faces and like events. For an example of these re-collections see Galton, *Inquiries*, 1883, p. 193. For smell imagery, see Ribot, *La Mémoire Affective*, 1894, pp. 379-81.

As we grow older, the earlier years lose more and more of their meaning, illustrative complications of old times being replaced by recent ones. Old notions and interests become obsolete and are forgotten, and new notions and interests take the vacant places. Thus the bulk of memories constantly shifts its centre of gravity, keeping close to the heels of the present. Because of this device the memory contents present many anomalies, and for this reason much which we re-develop is of less importance than much which we forget. For instance, I hear a witty saying. If I am preoccupied, I forget it almost at once, while if interests are pressing, it tends to be ignored. If, on the other hand, I have occasion to repeat it and repeat it soon, then this witticism is retained and prevents the ready assimilation of fresh ones. In this way accidental circumstances decide to some considerable extent that unimportant matters shall be re-developed, that others shall not be acquired, and that important ones shall be de-developed or forgotten. For the same reason persons who live much in the past and love detail will reproduce much, while those who live in the present and abhor detail will reproduce little. So also in a monotonous life little will be re-developed, since the later events displace the earlier, while in an adventurous career details will be unlike and will, therefore, not cover each other. Lastly, men interested in textual or historical studies will remember much.

It is difficult to determine the quantity of details re-developed from day to day. [*You might help in ascertaining the precise facts.*] In the twenty minutes' conversation recorded (sec. 108), I remember fifty-eight items which refer to the far past, the most distant being about eight years old. Thus in a casual and typical chat I retail an incident, about seven years old, containing forty details out of a possible ninety. Again, in another talk I refer to twenty-seven out of a possible forty-five details, at least eight years old. Under similar circumstances I re-develop seventeen details out of a possible twenty, at least four years old. Fearing that something would fall, I re-develop a similar incident six years old, and then another sixteen years old. Of course, on none of these occasions had I any thought of experimenting. Watching other people, they appear to me to re-develop systems at the same rate and in the same manner. Every day about twenty details referring to the more distant past are perhaps reinstated. [*Is this so?*] Few days pass without some old systems re-developing, while on favourable occasions several hundreds of these are re-manufactured. To take an extreme instance, one day I recorded in my note book one thousand items which I deliberately re-developed.

It is plain, therefore, that the total of details which may be re-developed is not the same as the total of details which we have lived through, and I surmise that, with trifling exceptions, recollections do not go back directly more than about two years.* [*This is a guess.*] It is also obvious (sec. 96) that *methods of work and thought, as well as much of our general knowledge, are over and over again applied within the year, thousands of them being repeated day by day.*

There is no princely path by which we can return the way we have come. Where there were stately cities and the hum of busy life we encounter ruins and a scarcely broken silence,* for only what perennially enters into our daily task and our homely thought is guarded against the wasting influences of time. Facts and fancies come to us thick as snowflakes. Most of these fall on uncongenial soil, and are no more; some of them lie on the ground for hours or days; nearly all are gone with the season; and a few only remain on the mountain tops. As a knight's shining armour, to put the matter differently, requires constant furbishing, so we are compelled continually to relearn as well as to re-develop. The majestic mountain masses and passes of Switzerland, the images of which lovingly lingered for years, are paling gradually but surely. The memories of the Capitol, St. Peter's, the Pitti Gallery, where they are not replaced by the images of photographs and pictures of those places, are lost in the hazy distance. The corridors of the Louvre, the Rue de Rivoli, the Avenue de l'Opéra, are fancies rather than facts now. Influences which promised never to abandon us, are growing dim and distant. Hence we have to re-read our books every lustrum if we have not outgrown them, and our beliefs must be re-examined if our faith in them is to have a reasonable foundation. A large portion of our life is thus given to fixing and refixing the shadows of things.†

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* "The pictures drawn in our minds are laid in fading colours; and if not sometimes refreshed, vanish and disappear." (Locke, *Human Understanding*, bk. 2, ch. 10, sec. 5)

115. THE PROCESS OF DE DEVELOPMENT.

There are a number of factors which conduce to obliviscence or dismemberment. The first in order is superficial primary attention (sec. 110a), and here it could easily be proved that we membered in the first instance, though we are unable to re-develop what we had membered. [*Prove.*] Next comes attention at the margin (sec. 110a), as in marginal sight, and here again a thing is no sooner observed than it is forgotten. [*Test.*] A similar factor induces forgetfulness in secondary attention. This happens when we are only interested in the most general features of an image. Under these circumstances, and they are most common, less and less of the image is re-developed until the barest outline remains. [*Examine experimentally.*] Over and above these attention aspects, comes *the fact of simple forgetting or de development.* For instance, I look at the underside of the seat of some particular chair, carefully and at leisure, and enter in my note book what I have observed. After twenty-two days it occurs to me to test my memory as regards the chair. For half-an-hour I try to re-produce the appropriate image as completely as possible, and I find that insistence does assist. I then enter into my note book the result of my reflections. When, for purposes of comparison, I look at the notes containing the first set of observations, I am unable to re-member anything more, though I strain hard for some minutes. Lastly, I view the upturned chair carefully once more. To my surprise I discover that my image is very incomplete as well as misleading, and it further transpires that what I observe is wholly unfamiliar. [*Experiment collectively with physiological and other diagrams.*] In such an experiment, then, it is made clear that lapse of time of itself mutilates and ultimaley kills memory.* Hence if we grant that memory is ever fading, we can understand the importance of recurring to a subject, or, as with the very young child, the significance of ceaseless repetition of every kind of activity.

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* "Time mutilates our memories. Like names written on the bark of a tree, they have become distorted by change of years" (Verdon, *Forgetfulness*, 1877, p. 447).

† Galton (*Inquiries*, 1883, pp. 185-203) has a short discussion which bears on the subject of this section.

From the last chapter we know that, roughly speaking, images develop out of other images or sensations, and that spontaneous images, apart from neural excitement, are practically unknown (secs. 90-2). At the same time development has its limitations. For example, the letter *a* being connected with the other letters of the alphabet, and these in turn with primary and secondary systems of every class, we might imagine that the letter *a* would tend to develop the whole of what we know. This is so far from being the fact that the letter *a* will generally suggest *nothing*. To be able to re-develop a fact which we are observing there must be close intimacy between it and some known fact, for when an observed fact is not related to anything established, there will be no obvious means of recalling it, and it will, therefore, tend to be forgotten. On this account it is well so to connect all that is worth re-developing that it may be developed pretty frequently, and since systems are seldom carefully connected with this end in view, most things are naturally forgotten. Furthermore, disintegration being a constant factor, it follows that what is little attended to becomes indistinct, and for that very reason it is neglected, dismissed and forgotten. Lastly, change of interest, largely due to periodic needs and the rivalry of primary systems, further weakens and destroys the traces of the past until there remains only a small residue of typical and firmly connected units of thought and action.

116.—RE-DEVELOPMENT IS ATTENTION TO SURVIVING TRACES.

In section 108, and again in section 109, I referred to the immediate constituents of primary and secondary systems. This, of course, includes what is re-developed. Let us pursue the theme a little further. Some one is an excellent mimic. I have reason to believe that he is a good visual and audile—one who well images sights and sounds. I ask him, "Do you re-member the hearth in Y.'s study?" "Perfectly," he replies, "I see it before me as if I stood in front of it." His eyes appear meantime rivetted on some uncanny object. "Can you tell me," I then continue, "the number of circles round the marble rosettes?" He is non-plussed, and that because there are limits to second sight. [*Test yourself and others in this respect.*] It is astonishing how much some people observe and re-figure; but though a man can re-member much, he soon breaks

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*An experimental study of this subject is found in Philippe, *Sur les Transformations de nos Images Mentales*; 1897.

down under a close examination. If we consider that to observe is to attend, we shall see how absurd it is to expect flawless observation by means of re-collection. If an object as such were *presented* to a *consciousness*, this would be probable because the object would be in consciousness. Not so on the theory of attention. When we look at an object, there is a constant flow of fresh images, for new systems are persistently being developed. Memory is re-development, and a full complementary image of an object would imply that we have exhausted the possibilities of observation.

There is another aspect of the above problem. I show to a friend—a good visualiser—a striking cartoon. He just glances at the sketch before I remove it, and I then put to him a number of questions as to the details he has observed. It is surprising how often he is right, and it is instructive to notice how often he is wrong. He sees three buttons where there is one. He describes the coachman's boots, whereas in the cartoon they are covered with a rug. Positive error thus enters into his image. [*Experiment.*]

The last statement provokes a question. If I changed the picture to suit his description and showed it to him, what would he say? For my own part I have little doubt as to how the query would be met. Judging from general observation I conclude that he would reply: This picture is different from the one you first showed me. He would find that the secondary combinations led to absurd images, and that when they were brought together they excluded each other. He would also on seeing the first sketch, remember its details much better. [*Test this.*] They would have an intimacy, comparable with that referred to in the example of looking over a little volume we have just finished reading (sec. 108). *We can often identify to a nicety an object when face to face with it, while free reproduction is yet denied to us.* In other words, recognition is superior to free re-development.

117.—No Detailed Image in the Memory.

The description of the image, in the case of the cartoon, is rejected in favour of the actual delineation. Was there then no fixed image or counterpart of the object? The next section answers our question in the negative. Observation is essentially organised. It is as far removed as possible from resembling the ordinary process of photography. Not only do we in practice chiefly see what we have seen before; but the whole attitude of observation is utilitarian. We are arrested for a moment by one or two attractive features. We do not fix an object with our eye camera, we walk around it. We do not take the whole of a scene in at once, but in a rambling fashion we observe a few details often and many details not at all, slurring over some, and dwelling upon others. The eye product, leaving aside after-images (sec. 125), is, therefore, substantially different from a photograph. Except with systems which we have developed repeatedly, and with such as we have just developed, images rich in detail do not exist normally. [*Have you detailed images?*] There is usually present a summary feeling conveying the total impression, and a number of more or less hazy and scrappy images.

Lotze (d. 1881) (*Microcosmus*, trs., 1885, i, pp. 326, ff.) holds that memory implies too complex a process to be accounted for neurally. He says that an object differs so much with the closeness and the position of the spectator that the corresponding image would, but for spiritual activity, be a mass of confusion. Wundt's explanation of Lotze's difficulty is of the composite photograph type. He writes: "If we think of an acquaintance, we never image him precisely as we saw him at a certain moment; our idea, on the contrary, is composed of many observations the constituents of which partly complete and partly dislodge each other" (*Bemerkungen zur Associationslehre*, 1891, p. 339).

The subject is one eminently fitted for experimental observation, and I have, accordingly, gone somewhat carefully into the matter. Testing the memory contents by the rule of objectivity (sec. 139), I find that the images of acquaintances are with me individual and not superimposed (sec. 76a). A particular re-developed system, or several particular ones, stand for the man or the woman. I cannot find any image which resembles a composite photograph or which is not individualised. Experiment confirms this. *I have specially observed a multiplicity of objects both stationary and in motion; some once, some repeatedly; some for a long time together, others for fractions of a second. The images never fused, though I often desired them to do so.* Most of them could be re-developed for a second or two; but they were soon forgotten. Changing objects, such as trees which I approached, offered several particular images, according to the transformations which I noted; exceptionally I could image the object as changing. There was neither a composite image nor a supra-mundane one. One minute's continuous observation could not be re-instated, owing to rapid oblivion. Some favoured snapshots survived, and those were the ones which went to swell the entries in my memory. However many deliberate experiments I made, the result remained the same. I claim, therefore, that Lotze and Wundt, and those who agree with them, are wrong as far as my memory is concerned. The only fact to be explained is why the second snapshot is more easily taken and preserved than the first. [*Diligently study your stored images, the creation of images, and the growth of typical images, as far as all the senses are concerned.*]

If we turn to a related class of facts, those of summary feelings and combination feelings, we come to a different conclusion. For instance, in reading a book, my opinion of it seemingly *grows* or changes as I read. So with the *impression* left on us by a visit in the country. Objects have thus a constant influence on us, leaving traces which in a remote way resemble composite photographs. However, this holds only of feelings.

118.—IMAGES ARE SOON EXHAUSTED.

An image scarcely arrives but it is gone, developing and disappearing within less than a second. [*Test.*] This might be explained, and, to a certain extent rightly, by saying that we dwell organically on images for a very short time. We have speedily dismissed, pre-developed and re-developed pictures millions of times [*is this so?*], it is argued, and, therefore, we are now unable to keep them before us. A different explanation appears more satisfactory. In studying, for instance, one of Raphael's Madonnas, there evolves a comprehensive summary feeling like the moods we have spoken of in sec. 109. I did not study the picture down to its minutest details; I was interested only in a general way. The attention given to sundry aspects differed, and I know the picture consequently as a whole rather than in its parts. When I stand before it, my attention is employed in rapidly and tentatively sweeping over various portions, and these are not fixed in my conception. In re-development, then, what happens is this: the outlines are vaguely re-instated, and along with these, or preceding or succeeding them, is the persisting feeling which evolved on the occasion when we took our many observations. This mood tells us, or can be made to tell us, how we were affected in the first instance. Fitfully one minor feeling relieves another, and these suggest the contents, or often they only hint at them. The crude and incomplete sets of outlines, indicative of the reality, hover about. Beyond details here and there I observed little, as my eyes, like search-lights, swept rapidly hither and thither. Hence attention,—at least in those who have not made a special study of that Madonna,—when directed towards this image, finds almost nothing to do, and seeks for pastures new. [*Test experimentally.*]

The incompleteness and waywardness of the attention chiefly account for the imperfection of the re-produced system. Let us apply this explanation to facts which are easily verified. Looking at a tree in winter we observe manifold branches and twigs. The whole appearance is like that of a gigantic coral. Could any one, I ask, re integrate such a tree so completely that he could forthwith start counting the leafless boughs one by one, as he might in a perfect after image? Most assuredly not. He has only scrutinised the tree superficially; he has guessed rather than observed he has only scanned some of its outlines and its general appearance; and he has gazed more or less inattentively and intermittently now at this detail and now at that. There was not one view; but there were various views, each incomplete.

Walking along a country lane, I notice the grasses which line both sides. What man could count the green blades and measure their length by developing the image of the country lane? This last case throws light on the question of what a casual observer re-collects of the Madonna. Suppose the whole figure covered with type such as that in which this book is printed. Could the observer at a glance read the whole type off the picture? Now the letters only give concreteness to the multiplicity of details of which the picture is made up, for just as the type yields a blur in the image, so the average view will, except for general outlines and special details, be a blur. Correct observation is the art of the specialist, and as a class of objects is more and more exhaustively attended to by us; as discrimination deals with more and more details; as innumerable details become well connected, so observation yields increasingly higher results. For this reason a breeder of horses recognises or connects a quantity of details where the non-specialist hardly sees any. Similarly, the lady of fashion, after a single set of observations lasting a second or two, can give a surprisingly detailed account of her rival's dress. So also the captain on a stormy sea quickly takes in the situation. In these cases recognition, being easy, proceeds generally apace. Speaking broadly, we only see a thing so far as it is known; so far as it is not known it is not seen, but represents a blur and is speedily forgotten. [*Observe a large number of objects with the purpose* *of testing the above.*] This confirms what we learnt in sec. 44 as to the superiority of systematic re-attention.

Experiment strengthens our conclusions. My eyes, in passing, catch one imperfect glimpse of some gold chains in a shop window, and as I continue my walk I say to myself, "That is a jeweller's shop." The general impression being one well assimilated, I do not trouble about a multitude of details. My attention fastens on a few trivialities, and everything else is left to be inferred. So also in the many individuals, vehicles and houses which challenge my interest. I member this or that semi-familiar detail, and ignore or conjecture the rest. In this way I recognise a whole street at a glance, observing very little as regards detail. In half-an-hour's walk my eyes alight on several thousand objects, just noticing them or selecting some peculiar feature. I hear a familiar person's tread, or catch a side glance of his coat tail, and that satisfies me as well, as regards his identity, as if I turned round and eyed him minutely. Again, my eyes pass by the object on the table which they are in search of. [*Test the above account.*] Observation, then, is not mechanical, but need-determined (sec. 78), and two-thirds of a second is the average time spent in the contemplation of an object. This can be thoroughly tested by examining a fine photographic view. On repeatedly inspecting it, we unmistakably note that all is not revealed to us at once,* and that it is only occasionally in ordinary life that we are detained for several seconds by any scene or object. [*Examine a good photograph.*] In frequent observations the same features, unfortunately, attract us. [*Test this.*] When, therefore, an average image is developed, it continues to exist only for a moment. It is otherwise when we have made a special study of an object. The man whom I have observed repeatedly, with a view to gathering a large number of details, can be re-developed for a considerable period. [*Test this.*] Minute observation, however, is rare, and the majority of images, therefore, no sooner develop than they de-develop.

119.—VISUALS, AUDILES, MOTILES, EMOTILES AND MENTALS.

This brings us to the consideration of a subject which has been much discussed. In some individuals visual images are developed with ease; in others auditory ones; and so on. In the language we have adopted we assert that in re-development attention is expended in proportion to the possible completeness of the re-production. We also infer that the strong visual is one who in the first instance attends efficiently, and that the observer who stocks no details, can never be an expert visual.

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* "Suppose that in the course of a few minutes we take half a dozen glances at a strange and curious flower. We have not as many complex presentation which we might symbolise, as F^1, F^2, F^3. But rather at first only the general outline is noted, next the disposition of petals, stamens, etc., then the attachment of the anthers, form of the ovary, and so on" (Ward, *Psychology*, 1886, p. 47, col. i). It must be added, however, that when interest and training are absent, repeated observation frequently refers only to what has been already observed. The ordinary man, in this respect, views the world as from a round-about or a rocking horse. He is unlike travellers who eagerly penetrate jungles, climb mountain-peaks, and cross deserts and seas.

Owing to this divergence in individuals, certain facts become obscured. Suppose I re-develop an incident. If I am a visual, I *see* the scene; if an audile, I *hear* what happened; and if a motile, I *re-enact* the event. [*Are you a visual, an audile or a motile?*] There are many persons, of course, who possess the characteristics of all these types. To take an illustration, I narrate to a child of four the story of "The Boy and the Wolf." When I have finished, he begs me to tell him the tale again. I do so. He asks me to repeat it once more, but I decline. He then starts telling me the story. By his strange gaze, the curious sound of his words, and his gesticulations, he betrays that everything is enacting itself within him. He seems to see the boy, the wolf and the sheep; to hear their voices; and to move with them. He tells the story so well, so vividly, that I feel ashamed of the baldness of my own narrative. Memory is, therefore, sometimes strongly realistic in several departments of thought, though the degree of realism varies with circumstance, with the individual and with age.

Some image nearly everything in terms of sight alone; others re-produce the living reality—the sight, sound and motion combined. There is another method of re-collection within these. Some persons are able, as it suits them, to image an object now in terms of sight and now in terms of some other sense, and such persons have been styled Indifferents. For example, in re-integrating a melody I have heard sung, I sing it to myself, or I merely listen. In the first instance, the larynx will be affected: but not so in the second instance. For this reason I can hum one tune while listening to another, or I am speaking while at the same time I am reading by the application of pure sight. I trill *r*'s rapidly while thinking in words; I combine sounds of every type while reading or listening imaginatively, and I see one object before me while imaging another. Hence in re-developing a duel which I witnessed, or in which I was one of the combatants, there need be no movements re-enacted and no sounds heard. I picture the sight alone. For the rest, nothing can be concluded as to the presence of a factor in average cases from what is done by persons under excitement, by infants or by old men. [*Test this paragraph step by step.*]

Bain (*Senses and Intellect*, 1894, p. 417) expresses a prevalent view, the truth of which has yet to be proved, when he affirms that an idea is "a past experience, revived on the same nervous tracks" and that "the renewed feeling occupies the very same parts, and in the same manner, as the original feeling, and no other parts, nor in any other assignable manner" (*ibid*, p. 356). So Spencer, *Psychology*, 1890, i: "To remember a motion just made with the arm, is to have a feeble repetition of those internal states which accompanied the motion—is to have an incipient excitement of those nerves which were strongly excited during the motion" (p. 448); and what "we call ideas, are nothing else than weak repetitions of the psychical states caused by actual impressions and motions" (p. 456). This view in itself does not settle the question whether we re-instate the visual or the motile aspect of an event, unless we assume that all memories, except as to degree, are faithful and complete copies of primary occurrences. A graver problem is involved when we sense one thing and image another at the same time. In such cases we have evidently two visual fields, while on Bain's theory, the sensory field should apparently exclude the imaged one and *vice versa.* I have made repeated experiments to assure myself that I am actually employed in seeing while a scene is re-developed, and the result I have seemingly confirmed the simultaneous double view [*Experiment in the* [illegible]]. As regards this matter Bain reasons, somewhat injudiciously, that since most people when excited tend to act out their thoughts, therefore they do so when they are not excited. He makes no attempt to settle the question by experiment or by direct and extensive observation. Of the experiments mentioned in the text, there is one which is exceedingly difficult. It is only rarely that I can hum one tune while listening to another tune emanating, say, from a musical box. The greatest feat for me would be to recall vividly two tunes at once, or to listen simultaneously to two conversations. It will be understood, of course, that it is easy to hear sounds while humming, but that it is difficult to weave them into a melody. See also Binet, *L'Image Consécutive et le S*[illegible]*uel*, 1885, and Féré (*Sensation et Mouvement*, 1887, p. 16), who asserts that "the idea of a movement is the movement already begun."

I have referred to visuals, audiles and motiles, but no limit should be drawn at these types of minds. We can, for instance, construct an emotile class. In this category would be placed those in whom by preference the emotional accompaniments of any event were redeveloped. They would recollect in terms of emotion. All that was felt, the emotiles would conscientiously reconstruct, but what was not emotional they would apprehend, like one who is short-sighted, indistinctly. One can, with advantage, suggest a fifth and last class [*disc*[illegible]] and name them mentals. These only redevelop the irreducible minimum: words, faint summary feelings and combination feelings. Through the restriction of attention, they tend to eliminate the visual, audile, motile and emotile aspect. They are aware only of feelings which indicate redevelopment of happenings, and which have been already referred to as summary feelings and combination feelings.

Galton (*Statistics of Mental Imagery*, 1880) was the first to draw attention to the question of visualising. See also Angell, *[illegible]*, 1897; Albert, *Die [illegible] Sprache*, 1890; Baldwin, *[illegible]*, 189[illegible]; Bentley, *The Memory Image and its Qualitative* [illegible], 1899; [illegible] *et Images Motrices*, 1897; Binet, *L'Image* [illegible], 1885; Binet, *De* [illegible] *mouvement*, 1886, pp. 155; Binet, [illegible] *Mentales*, 1887; Binet, *La Concurrence des États Psychologiques*, 1890; Binet, *Psychologie des Grands Calculateurs et Joueurs d'Échecs*, 1894; Binet and [illegible], [illegible], 1895; Bourdon, *Les Phénomènes Intellectuels*, 1895; [illegible], *A Study of Imagination*, 1898; Dugas, *Les Différents Types d'Images*, 1895; Erdmann and Dodge, [illegible] *Lesen*, 1898; Granville, *Secret of a Good Memory*, 1880; Heller, *Zur Blinden Psychologie*, 1895; Hitschmann, *Ueber Begründung einer* [illegible] *Blinden*, 1892; Lay, *Mental Imagery*, 1898; Paulhan, [illegible], 1883; Paulhan, *Le Langage Intérieur*, 1886; Paulhan, *L'Attention et les Images*, 1893; Philippe, *Images Mentales*, 1897; Philippe, *Les Transformations de nos Images Mentales*, 1897; Kuhlmann, *Die Entwickelung* [illegible] *Kindern, etc.*, 1897; Scripture, *Arithmetical Prodigies*, 1891; Secor, *Visual Reading: a Study in Mental Imagery*, 1900; Stricker, *Sprachvorstellungen*, 1880; Stricker, *Bewegungsvorstellungen*, 1882; Stricker, *Sur les Images Motrices*, 1884; Stricker, *De la Parole*, 1886; and Talbot, *An Attempt to Train the Visual Memory*, 1897.

120.—THE MATTER OF MEMORY

I have lightly spoken of visuals, audiles and motiles, as if all primary systems were equally reproducible. The slightest attempt at introspection will, however, discourage such a conclusion. Let any one endeavour to re-develop smells or tastes, and he will most probably find himself baffled [*Experiment.*] This being the case, we must ascertain with some exactness what, and to what extent, primary systems are normally re-developed.

In the first place we note that children are generally strong visuals — whatever else they may be, while with adults, visual imagery also takes the most prominent place. [*Experiment.*] Owing both to education, to practice and to congenital disposition there are undoubtedly considerable differences in visualising capacity, but these do not affect the main fact.

Next in order to sight, comes hearing. As we shall learn from sect. 1 b, there is little agreement concerning the audile memory. For my part I cannot help feeling that I can re-member the voices of friends though I find it difficult to hear them say much. I also appear to distinguish in memory all the degrees from a whisper to a loud sound. Moreover my sound memory extends to all kinds of sounds, including many which I cannot in any way imitate. As with sight, so with sound. Sounds of any kind that have been but just heard can be re-developed with comparative ease, fulness and accuracy.* [*Experiment.*]

When we come to smell systems, we find that many persons at least cannot re-develop them. In my case, what little smell memory I appear to have, consists probably of an impression of the effect of various smells upon me, together with slight nasal activity. Neither in dream life nor in imagination have I smelt unless a substance having smell was present. At the same time, the recency of the actual smelling, excluding particles still lodged in the nostril, does not assist smell images.† [*Experiment as to both recognition and recollection of smells.*]

What is true of smell, holds of taste. Within my observation I have never caught myself tasting anything in the imagination. Taste, then, is also most likely excluded or nearly so from the secondary realms.‡

To complete the crude orthodox classification, we have to add a word as to re-developed touch systems. As regards these latter, it seems probable that touches are as little re-developed as smells and tastes. Other sensations, such as those of temperature, of the muscles, of general sensibility, are equally difficult to remember, and it accords with this that the remembrance of pleasure-pain is usually out of the question.

However, when so few of the classes of sensations appear in a secondary form, summary feelings and combination feelings share with sight and sound the honour of occupying the secondary plane. Mere sight images, apart from an aura of feeling, have scarcely a place in the memory. We may note also that summary feelings, in comparison with other sensations, persist for a very long period. [*Think of various colours, sounds, tastes, smells, etc.*]

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* Zwaardemaker, *Der Umfang des Gehörs in den verschiedenen Lebensjahren*, 1891.

† Zwaardemaker, *Die Physiologie des Geruchs*, 1895; and Passy, *Revue Générale sur les Sensations Olfactives*, 1895.

‡ Kiesow, *Beiträge zur physiologischen Psychologie des Geschmackssinnes*, 1894-6.

§ Fechner (*Elemente*, 1860, ii) says that he can only re-member colours connected with striking impressions, and then only doubtfully and hazily (p. 470). His wife could easily re-member tastes and smells (p. 482).

Naturally the question uppermost at this point must be why only certain senses reach the secondary plane, and why sight is the most favoured one. Comparing sight with sound, certain sight-favouring factors are educible. Sound, unlike sight, offers to observation no continuous plane, gives the three dimensions in one, and is only casually traceable as regards any object or combination. The eyes, too, can fix a view more freely and for a more prolonged period. So also sight offers more in respect of details, quality and quantity. The consequence of this is, according to Case 2, that attention being far more occupied with sights than with other sensations, memory is most complete in matters of sight. For similar reasons, the sense of touch is inferior from the memory point of view.

The touch field* is very limited, *i.e.*, restricted largely to the hands; it is complicated with muscular and other sensations over an extensive area, the detail is ill defined and not easily met with a second time; the impression made evaporates almost at once, leaving no scope for the recency factor; as compared with sight, little detail is given at a time; and continuous attention very quickly causes the cessation of the touch sensation. [*Test.*] Factors such as these also account for the inferiority of the other sensations in respect of memory.

Great mobility has also to be taken into account. The two eyes can rapidly move upward and downward, to right and left, without involving the movement of any other structure. The ear is in this respect less favourably situated. It cannot be shut like the eye, and in normal individuals pricking the ears is the utmost that the ear can do in the way of movement. Hence the ear is more dependent on other functionings, though it is largely independent of angle and walls.

Mobility is at a very low stage as regards the sense of smell. We can only to a slight degree widen or contract the nostrils, while regulation of the breathing through the nose is almost the only independent mobile factor. At the same time we cannot easily shut out smells, and when smells pervade a place in which we are, the olfactory sense refuses to act. It is, therefore, easy to understand how inferior smell is to vision.

The sense of touch has also serious drawbacks. First, only certain far off portions of the organism, such as the finger tips, are highly sensitive. These are also mobile; but not in the same sense as are the eyes, since the handling of anything by the fingers generally requires movements of parts or of the whole of the body. The movements, too, if anything is to be observed, must be somewhat slow and deliberate. The eye, on the contrary, rapidly takes in a whole landscape.

As the superiority of the sense of sight is so evident as regards obtaining information effectively, that sense is naturally the most active and fruitful. Hence we can understand that, other things being equal, the sense of sight should play the leading part on the memory stage. Again, the mobility we have spoken of touches secondary as well as primary systems. Not only does movement exist in pre-membering, but it shows itself in re-membering, though to a slighter extent. The exact data on this point are still lacking. What seems to happen is that only the initial steps in every movement are repeated. Thus instead of the eyes, in secondary vision, boldly moving to right or to left, there is, on this hypothesis, only the strain or impulse which goes with the inception of the movement. Hence the secondary sweep of the eye resembles the primary sweep in every detail, except completeness. The movements being essentially alike in both sweeps, we have essentially the same results.* It is in this fact of independent mobility that we shall probably find the explanation of our being chiefly visuals as regards the secondary realm, and it is this also which explains the perfection of language memory, since here there is available, besides the organ of sight, the highly mobile lingual apparatus. Since in smell, in taste, in temperature and in touch, independent mobility is so small, sensation would only be repeated in those directions to a minimal degree, if at all, and hence there would be but minimal memory as regards these senses. With reference to pleasure-pain the same fact is fairly clear. Pleasure-pain being of the nature of a general disturbance or shock, it will only be appreciably re-developed when there is a repeated general disturbance, e.g., under the influence of excitement. Reviewing this intricate aspect of the question, the conclusion seems warranted that the difficulty of re-exciting a function, together with the high state of development of that function from the point of view of attention, are the factors which determine the fulness of memory. [*How is the case of Fechner's wife to be explained?*]

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* Henri, *Recherches sur la Localisation des Sensations Tactiles*, 1895; and Weber, *Der Tastsinn*, 1849.

When we come to the feelings of delight and sadness, hope and despair, emphasis and doubt—feelings which lend thought its warmth and its life,—we are tempted to deny that these feelings have secondary characteristics at all. We may be inclined to call them mere repetitions of feelings which were formerly felt. We might argue that a man's eyes and features speak eloquently of his feelings when he is absorbed in memories, and that, therefore, we have present in such a case pre-developed feelings and not re-developed ones. We might further insist that these feelings, as revealed by introspection, have a purely primary character, and suggest nothing secondary.

In a sense the view just put forward is correct. The truth appears to be that *the matter of primary and that of secondary systems is strictly one.* The feelings, accordingly, as well as the sensations, always remain the same whether it be a question of pre-developing or re-developing. Thus visual and aural systems of a secondary order differ in no substantial respect from visual and aural systems of a primary order. In memory we have merely repetition. Where influences beyond the body are concerned, as in sight or hearing, certain parts of the action fail to be repeated; whilst in the case of feelings or organic sensations the repetition may be complete. Hence *primary and secondary systems offer the same matter to inspection*, and only the setting or the environment is changed; and this conclusion again confirms our belief that the motor activity implied in primary systems recurs in secondary systems.

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* Ferrier (*Functions of the Brain*, 1886, p. 463) says: "When we think of a large or distant object the eyes are divergent or parallel; when we think of a small or near object the optic axes converge." [*Test with mirror.*]

The question thus arises whether there is any essential difference between thought and action. Taking a normal instance, this seems to favour the existence of such a difference; but we may choose examples which introduce considerable doubt. For instance, resting in the tall grass by the roadside, I hear some one approach. Though he is alone, he is speaking aloud and gesticulating freely, as if he were engaged in an exciting conversation. Assuming now for the moment that this individual cannot image sights, and we have a man the matter of whose thought in no way differs from primary activity of a normal character. Thought, in this case, is "acting," in the actor's sense; though the "actor" is here an extempore playwright also. Such thought is indistinguishable from the actions of an engineer who, with his hands, is thinking out some piece of work. Other instances illustrate the same point. We may sing aloud a song that we know, or recite aloud a favourite poem, or quote to some one a remark we had made on a previous occasion. In these cases what is re-membered is pre-membered, and, as far as the "matter" of thought and action is concerned, no difference is discernible. As I am writing now, I audibly whisper the words to be written. Here the voice is merely lowered in the process of thinking. However, this lowering may continue, until I alone can hear myself; and, further, the movements of throat, tongue, teeth and lips which are so frequently observed and so difficult to avoid, may apparently disappear in thought speech. *All that we note, then, in normal thought processes, is a very low degree and restricted range of activity.* A microphone might, for this reason, betray our innermost word thoughts, and our whole "inner" world will perhaps one day be open to others. Those who do not accept such conclusions must point out the essential difference between loud and silent soliloquising.

If we once admit that the matter of thought and action is at best only distinguishable in degree, we may further determine the precise meaning of the degree. Seeing that speech may be loud or soft, and accompanied or unaccompanied by gesticulation, we learn that thought may be simplified along two lines. The sensation or pre-integral may be reduced to its simplest form, *e.g.*, a grey outline may take the place of the coloured complex; and, secondly, thought, as was remarked in the last section, may only repeat the visual, the audile or some other *single* aspect. That simplification will normally take place, is evident from two considerations. It is inconvenient to one self and to others to utter one's thoughts aloud or to gesticulate; and it is also against the nature of the need-determined attention process which we have dwelt upon in ch. 2, to elaborate anything more than is necessary. Hence, thought will naturally tend to be simplified and simple. *In thought, then, we have a simplified and lessened discharge.* We, therefore, reach again the conclusion that, in the memory, motor activity is present in a simplified form.

The re-development of all that is directly dependent on the body and independent of the body's environment, as summary feelings and combination feelings or, again, our bodily actions, raises no difficulties, since the body is ever-present. Embarrassment, however, arises when visual and audile images are in question. Here the matter is generally in part of extra-bodily origin, and the problem needs special elucidation. There appear to be only two probable explanations. The light-dust and the sound-dust, as happens in dreams, may be elaborated into certain definite images; or else the primary effect leaves traces which allow of re-elaboration. The latter of these courses seems the more probable in the case of normal thought.

We are not justified in asserting that we hear in the ear, any more than in saying that the mouth is the stomach; that is to say, the sensory organs are not the senses, and sensations are hence the outcome of manifold transformations. When, therefore, a particular modification of the brain is centrally stimulated, we obtain the same result as in afferent stimulation, minus the full effect on the sensory termini.

There is one great difficulty in the theory of simplified and lessened discharges. As regards feelings of every kind, it is generally admitted that one class of feeling, such as sadness, excludes its opposite, joy. In this spirit we are told by Ferrier that "we cannot feign grief with a smiling countenance" (*The Functions of the Brain*, 1886, p. 461). As regards sight and hearing, however, it is a plausible surmise that sight sensations do not exclude sight images. Observation speaks with no uncertain tones on this subject. We may be engaged in continuous reading, and yet our thoughts may be roaming in distant visual regions. We may be visually regarding one object while deliberately awaking sight images. We may, for experimental purposes, pre-member and re-member sights at the same time, or at least we may feel convinced that we are doing so. I have on innumerable occasions tested the possibility of seeing one thing and imaging something else, and the evidence always favoured the double process theory. Against this latter notion one can only contend that the evidence is unsatisfactory. Visual sensations, as we know, persist for some little time after the stimulus has been withdrawn, and visual images only require a maximum of about three quarters of a second to be elaborated. Under these circumstances, probability demonstrates nothing. We may be looking on and off when we think that we are looking continuously. The only satisfactory course is rapidly to explore with the eyes one picture full of detail, while at the same time re-developing, say, a long walk in equal detail and continuously. Even then we should have to be careful that pre-membering and re-membering do not occupy between them the one simultaneous total field of sight. However, experiment alone should settle this matter.

An additional argument in favour of our position is that the primary and secondary field of observation are alike in extent, and that granting slight variations, we cannot in imagination see or hear more than in reality. [*Test this.*] The range of sight or hearing is the same in sensing and in imaging; in fact, the latter is as a repetition of the former. In secondary speech I note the same pauses and changes in tone as in ordinary speech, though sounds are more frequently slurred. [*Examine.*] In secondary sight I observe the same method as in ordinary sight of turning at a certain time rate from picture to picture, and from one part of a picture to another part, while the images are developed in the positions in which they were originally observed. Often, indeed, the memory time rate is slower than the observation time rate.

To summarise this long section. The matter of memory and reality is one, "primary" and "secondary" being terms which refer to modes and arrangement of combinations and not to the material of those combinations. Nevertheless the two realms are not strictly co-extensive, for sight, sound and feeling alone appear in re-development, and then generally in a vaguer and simplified form. The reason for the exceptions just referred to we have traced to the differences in the apparatus of sense, the more frequent employment of these apparatus and their greater independence and more conspicuous usefulness. We have also seen it to be probable that sensations and images which occupy the same position as to space always exclude each other, since the primary and secondary field are one. [*Question this.*]

A few remarks as to the third dimension imaged will be found in sec. 169, while some reference to motion as sensed is made in sec. 174. Here I shall treat of two matters, the first one being the nature of imaged motion.

120a.—Motion as Imaged.

I have made frequent allusions to the universally admitted fact that we ordinarily image motion by re-developing momentary impressions as does a photograph. I never doubted that one could readily image objects in motion if one so desired. However, on attempting to do so, I found myself face to face with a new set of problems. The final results of the investigation are contained in what follows. I can, for instance, without difficulty obtain a continuous imaged view of the objects in any room I well know, a view nearly equal in character to the one procured by ordinary movements of the eyes, head and body. By looking at the pavement for some yards ahead of me, I can, on shutting my eyes, image the visual changes for that distance while I am walking. Looking at well known shops under similar circumstances, I can apparently pass by them and observe the changes which ordinarily result from such movements, and this I can do almost to perfection when on the top of a moving tram-car along a well known route. Given, therefore, what is continuous and well known, and I can image it as passing along; but if what is continuous is not well known, then I can obtain merely a series of pictures. I cannot image a carriage or a person as moving along; for if I try to do so, I see a carriage or a person in a certain fixed attitude. Nor can I ordinarily image anybody or anything moving or acting in an environment that does not move with them. The reason for this inability seems to be that in imaging that which moves continuously, as the view of shops, we image no environment in addition; while in imaging a carriage moving along a road, we can only do so, if we image the carriage *and* the houses which the carriage passes by. Hence unless we do, or can, re-develop in progressive order the enormous quantity of qualitatively distinguished sights which we observe on such occasions, we shall see a stationary carriage. In actual observation this happens when the lights of a train are seen from a distance at night time, for then we have no decisive means of telling whether the train is stationary or not. Now as only the essential portion of what we see is normally re-developed, *i.e.*, that which falls within the focus of interest and observation, and not the vast mass of what surrounds it, it follows that images must ordinarily appear as fixed. In my case this is so, and though I have experimented at some length in the matter, I can see no escape from the above conclusions. For this reason, I am quite unable even immediately after close observation, to image a thing as acting or moving; nor can I image my own leg or foot movements while walking. [*Walk in imagination, counting steps, and compare; thus follow second-hand of watch.*] Falling within my own observation, I only know of two classes of exceptions to the above rule. In dreams, as we shall see, we make up our setting, and hence the required conditions for imaged movements exist. In the waking state, on the other hand, I image, or seem to image, movement when under considerable excitement. Thus when I vividly imagine a physical struggle or a sensational scene, the event seems to take place before my image eyes. In all such instances, however, not only is the emotional aspect realistically developed; but the movements are plainly acted by me, while the setting is probably constructed as in dreams. [*Think of bicycle, tram, train and cart in motion; measure and count in imagination objects you know, and then verify.*] We may, therefore, sum up by saying that imaged visual motion, depends on completeness of re-development, and that in proportion to the absence of such completeness, we are less and less able to image motion. Only this should be added that there is good reason to think that most persons have too imperfect a memory to image things moving in a stationary environment. This is, however, a matter for careful scrutiny, as I find that with shut eyes I can follow extremely well known movements such as the slow doubling of the arm. [*Test the whole paragraph step by step.*]

Further examination of the problem of imaged motion suggests another obstacle to the images rivalling the sensations. If we see a greyhound running a course, some sixty seconds may pass before the course comes to an end. If we are close by, we notice continuously the chief features in every one of his movements. In correct memory, then, it should take sixty seconds for the imaged dog to finish his course, while his movements should be observable step by step. For my part I find that in me the sense of time is entirely wanting as regards visual imagery, and that, therefore, I cannot image motion generally, since without the time sense all correct imaged motion is impossible. This difficulty appears to be a fundamental one, and seems to hold of all persons. The matter, however, must be probed by many before an emphatic pronouncement can be made. [*Experiment.*]

Stricker (*Bewegungsvorstellungen*, 1882) mentions in the preface to his excellent little book that he finds it difficult to image motion. He holds that motor ideas are due to feelings in the muscles, and not to either sight or touch (p. 3); that in thinking of oneself as moving, muscle feelings are essential (pp. 12-3); and that the same holds of re-development as a whole (p. 18). From this he concludes generally that since all action, primary or secondary, is connected with muscle feelings, therefore men have, by invariable association, an irresistible tendency to explain motion of every kind by reference to a force which is supposed to propel things.

120b.—THINKING IN WORDS.

Having dealt with the nature of imaged motion, we may enter upon our second inquiry, the nature of word images or thinking in words. Stricker (*Sprachvorstellungen*, 1880) reasons along some such line as the following. With the re-development of letters or words are connected certain feelings in the muscles of articulation. These feelings have their source in impulses coming from the neural speech centre, and pass through the motor nerves to the muscles, while these impulses again enter consciousness, and we localise them in the muscles (p. 100). Stricker argues in detail that all persons have those muscle feelings when thinking in words, and he also reasons that only exceptional persons hear their voice in thinking. We think, so to speak, in muscle feelings. Accordingly he reasons that we re-develop letters, and not words (p. 85); that neither two like letters, nor two like words, can be developed at one and the same time (p. 86); and that when we read one thing and recite another, it really is as if two persons used one typewriter simultaneously (p. 90). Ballet (*Le Langage Intérieur*, 1886) almost dismisses Stricker's point of view with the barren and unsupported statement that the Austrian professor is a motile. It will, however, require a great deal of scholarship to affect Stricker's main positions. Dodge (*Wortvorstellungen*, 1896) usefully suggests that Stricker's innervations are more probably touch feelings (p. 27); he also points out that, as in eating, the lips are frequently moved without our thinking of letters (p. 34); and he inclines to the view that what distinguishes speech from other motor elements is "a kind of unlocalised, paled, acoustic image" (p. 35). I feel diffident in taking sides. The one thing that seems clear to me is that my word thought is aural in the ordinary sense of that word. I *hear* what I think, and these sounds have the qualities of the sounds which they reflect. I often observe the muscle feelings referred to by Stricker; but by no means always. When I am thinking while I am reading, or when I am absorbed, I consider it almost certain that no muscle feelings exist and that the thought is entirely aural. So, too, I still believe that two sets of words, repetitions of each other, may be recited simultaneously, one set being heard and the other spoken. However, the whole problem of speech images awaits yet fuller study by men of Stricker's scholarly character.

121.—THE GROWTH OF THE MEMORY.

All development is need-determined, and primary and secondary activity, as we learnt in the last section, are indistinguishable from one another in all but circumstance. In the growth of the memory, therefore, we merely trace the stages of development as far as repetition (or continuous activity) enters into the problem.

In the abstract it might be imagined that repetition makes no difference or a great difference to any function. For example, fabulous quantities of water may flow through an iron pipe without much affecting it, while, on the contrary, a breath will cause an elaborate house of cards to tumble to pieces. Going to our data, as supplied by our knowledge of the human organism, we find that repetition is need-determined and has only appreciable advantages when it spells vigorous activity. In the latter case, a system is developed with greater ease a second time, and from this it follows that much vigorous repetition along many lines alone makes complex processes, such as are involved in thought and action, possible. Consequently in the adult, combinations (acts or thoughts) will readily develop

The manifold functions of the body at birth are already part of the great fact we are dealing with; and in so far as exercise assisted in their formation, we might call these functions *pre-natal memories*. However, as far as extensive re-collection is concerned, the new-born infant is very far below the adult. We, therefore, begin our examination with the child after birth.

The lowest kind of memory which is at first prominent, may be called *exercise memory*. For the first few months of its post-natal life, the child's muscular system is busily exercised. Fingers, hands, wrists, arms; toes, feet, legs; the head and the trunk; the voice; are exercised so as to develop to the utmost the muscular system. The consequence of this is that the adult can scarcely effect a movement which is new to him, and hence his marvellous quickness and readiness to move portions of his organism or to work out problems (sec 19).

The next form we may call *detention memory* or *recognition*. In the exercise memory this recognition is also implied in the sustaining of a particular class of movement. Still, detention occurs more especially or more strikingly in the first stages of seeing, hearing, etc. Any relatively familiar sight, for instance, detains the eyes in proportion to the quantity of repetitions. Thus the child grows to recognise its hands, its mother, its most faithful companions, and its special surroundings so far as they interest it. And, again, response to sounds becomes more and more effective with repetition. Exercise memory has large scope in the adult, and is evidently the most primitive kind of memory. When we come to detention memory a higher stage is reached: it is the stage of primitive wonder, and wonder, we know, is the beginning of wisdom. As is well known, it is easier to recognise a thing than it is to redevelop it in its absence.

Advancing, we come to *action memory*. By a series of need determined feats, the infant begins to indulge in combined movements, such as using both hands together or looking at its own busy hands, or interpreting a sound as issuing from the person looked at. It is owing to this absence of combined activity that the infant readily responds to touch, and that it attempts only later to co-ordinate sense impressions. In these primitive instances we have combined exercise and combined recognition rather than action. It is only when the child conveys things to its mouth or rubs its eyes when sleepy or when, again, the eyes begin actively exploring, that we have action. Out of such small beginnings more and more complicated actions develop until we marvel at the wonderful dexterity of the adult. Given simple actions such as those enumerated, and it is easy to see how the most complicated actions follow. Exercise of parts ends in combined functional exercise until it is difficult to think of any adult's action which does not largely consist of memories.

Increasing in complexity, we meet with *recency memory*. Here some little time elapses between one act and its repetition, several acts of a different kind being perhaps interposed. For instance, an infant not quite five months old, touches a dinner plate which is somewhat removed from it, and after a while repeats the action several times. Or else it readily looks in a direction in which it has been recently looking. From such germs develop the complex states which we have discussed under the heading of Recency (sec. 110a). What we do, allowing for needs, not only tends to be repeated at once, but also after a short interval. Here we have made another advance. In the three previous kinds of memories repetition was immediate; in this kind of memory it is mediate. It proves that a brain area remains sensitive for a certain period. Accordingly, as the infant grows, it not only tends to repeat a movement or a word incessantly; but it tends to recur to them repeatedly soon after the repetition, and in this way the memory is stocked. Hence a combination tends to be retained or resist dis-memberment, and combinations, therefore, take firm root and are readily re-developed.

In *free memory* or ordinary memory, we have only the above mentioned factors combined and developed. On being presented with something, the child has learnt to say unintelligently "tah." Later on it will volunteer intelligently "Thank you." Granted such recurrence, and the most complex speech, made up as it is of re-developed words and familiar turns, is readily explained. As we saw in ch. 4, excitement and development, under the pressure of needs, explain the thoughts and actions of an adult, and such excitement and development already exist in the infant. With the re-development of *A*, *B* is made possible, with that *C*, and so on. Given, then, the existence of a need seeking satisfaction, and the re-development of *A* will be followed by *B*, and that by *C*. The chief change which takes place in the period between infant life and adult life is the storing of the memory and the simplification of acts when they do not need to be bold and explicit, *e.g.*, in thought. The adult's memory is, then, the child's repeated activity expanded and yet simplified. Instead of thinking aloud and gesticulating, the adult thinks largely in summary feelings and combination feelings.

Several authors distinguish between re-developing and knowing. Thus we say that we re-member seeing an intimate friend yesterday; but that we know, believe or doubt, that we have seen him previously. To know something is to "connect" it with something else. Herbert Spencer says: "To ask a man whether he remembers that the sun shines, that fire burns, that iron is hard, would be a misuse of language" (*Psychology*, 1890, i, p. 450). Again: "A remembrance implies a consciousness, and a consciousness implies a perceptible duration" (*ibid*, p. 447). See also: Allen, *The Recognition Theory of Perception*, 1896; Allen, *Recognition*, 1896; Bergson, *Mémoire et Reconnaissance*, 1896; Bourdon, *La Reconnaissance*, 1895; Dearborn, *Recognition under Objective Reversal*, 1899; Höffding, *Zur Theorie des Wiedererkennens*, 1892; Lehmann, *Ueber Wiedererkennen*, 1888; Lehmann, *Studien über das Widererkennen*, 1891; Malapert, *La Perception de la Ressemblance*, 1898; Ward, *Psychology*, 1886, p. 63; and Washburn, *The Process of Recognition*, 1897.

122.—THE ELEMENTS OF MEMORY.

A few sections back it was pointed out that as the individual matures, so his newly acquired knowledge is new only in a relative sense, and that it is because of this that he observes and memorises quickly. An important truth follows as a consequence. In chs. 2 and 4 we asser
perceptions and ideas are not stored. We have seen since how
would be to stow away these complex systems, of which but a mic
portion is ever re-developed, and it was also suggested in those chapters that sense systems do not differ in kind. That is, just as one wh
type-writer employs the same steel letters over and over again in
book, so we imagine that combinations are produced neurally
simple process. The number of elements is perhaps comp
and the elaboration of these into particular wholes
memory, etc. In fresh reactions, therefore, only the
new, would create obstacles to assimilation, while every sensation or image

is, on this hypothesis, a brand-new synthetised set of elements. Hence in the life of adults totally new occurrences are rare, and re-development is rapid on account of this. We, therefore, easily re-develop what is old, though much attention must be devoted to learning what is new, and this explains the tendency of traces to be wiped out. It also makes it clear that we are not bound to assume the re-development of countless events, and that there is no justification for the assertion that a system has not been re-developed for a long time. The same components, more or less compounded, form part of hosts of reactions. What remains to be explained is the method of the composition of the parts; but this must be left to the physiologist.

123.—WHAT CONSTITUTES A PERFECT MEMORY?

Secondary, like primary, systems have a part to play in the satisfaction of needs, and hence the limitations of secondary systems are of importance. The results arrived at in the last section but one, assist us here; for the best memory is the highest memory spoken of there. *A good memory will readily retain much for a long time, and the image will faithfully and completely represent the sensation, being neither distorted, nor simplified, nor in any way changed.* These desirable characteristics are by no means universally observable. Some persons find it difficult to learn anything by heart: they can retain but little, and that for a short time only. The image, too, in many cases neither faithfully nor completely represents the sensation, being distorted, simplified and changed in various ways. Retention represents, however, but one aspect of memory. It is not enough to retain; one must be able to re-develop at will what has been retained. That is to say, assuming adequate retentiveness, there remains the need of adequate re-development. *In a perfect memory any fact needed develops at once and without effort.* In ordinary re-collection, on the contrary, several factors have to be considered. We may be compelled to employ measurable effort; we may require to go through a good deal of haphazard re-development before the needed system develops; we may have to fly to some closely related fact before being successful; and we may be unable to re-instate a system, though we recognise the relevant detail we are in search of when we stumble upon it. A perfect memory, then, retains well and re-develops readily what is relevant. My own memory well illustrates the defects of memory. One Spring time I had examined large numbers of the wood anemone, seeing multitudes of specimens day by day. The following Spring I went into the country and saw by a brook what seemed an unknown flower. This stranger proved to be the wood anemone. The memory had completely faded, retention having been at its minimum. With respect to the absence of a serviceable memory I may refer to the following incident. I thought that a want of retentiveness might be overcome by repeated committal to memory. I consequently read three times consecutively a certain work in which I was specially interested. The result was that while, as I read, very much was regarded as familiar and known, yet hardly anything could be freely re-developed. In a perfect memory, on the contrary, a single reading would have sufficed to ensure both adequate retention and relevant re-development. [*Test collectively as regards goodness of memory.*]

124.—PRIMARY AND SECONDARY SERIES DISTINGUISHED.

Certain cases suggest a solution of the problem of finally distinguishing between memory and reality or secondary and primary combinations. For instance, I have several times thought of a face without being able to determine whether I had seen that face in a picture or in life, or whether it was the work of the imagination. In such cases I have for days most minutely examined my state until the face was *localised* in some series. [*Repeat this.*] Localisation, and that alone, seemed to settle the order of facts to which the face belonged. If I connect my vision with a certain house I frequent, I speak of the face as being re-developed and real; if I re-integrate a picture to which it belongs, I recognise that it is a copy of a copy; and so on. We are, therefore, right in speaking of a world order in which all happenings find their allotted position. Memory, imagination, dream life and reality would thus be determined by the place which any fact occupies, and by that alone. If found at one point of the world web, we should speak of co-existence; if at another point, of succession. Everything would depend on the company in which the data were met. For this reason, as we have seen above, an unlocalised fact cannot be said to belong to one group rather than to another. For instance, suppose I member a beautiful palace. I find no room for it in the connected series of visual impressions which are streaming into my open eyes, and I exclude it, therefore, from that order. I cannot, at the same time, re integrate a picture, a fancy or an event into which it logically fits. I can, however, trace the palace to a set of happenings between yesterday and to day, and I fix its position accordingly, and speak of it as a dream image. It is in this manner that we generally proceed. *We declare a thing to be real or objective, omitting indirect thought, because it forms the fringe of the total world order.* For the same reason we speak of something as long past, because of its position in the series. Time and space, then, are words which indicate the relation in which facts stand to one another. (Secs. 182 3.) In the widest sense, therefore, we are entitled to regard reality, memory, imagination, dream life, time and space, as constituents in a world order, the relative position determining in each case the sub-order to which a particular combination belongs. In other words, we classify a fact according to its setting.*

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* This is Ward's view, *Psychology*, 1886, p. 63; also Ribot's, *Mémoire*, 1881, pp. 32-46; and Vaschide's, *Localisation*, 1896. In a qualified manner Wundt (*Psychologie*, 1893, ii, p. 461) agrees that localisation in a series is one of the two signs of the past, the other and more important factor being, according to him, the diminished intensity of the image.

125.—AFTER-IMAGES,* ETC.

The student who has *good* eyesight,† and only he, should verify for himself some of the undermentioned facts and determine them in greater detail. He should vary the conditions as to colour, time, distance, size, shape and celerity. Quick, exact and exhaustive examination, together with an aptitude to change the method of attack, are to be practised by the learner as well as by the teacher. Traditional science is no science at all.

(1) *Positive and Negative After-Images.*—I look for a moment at the incandescent electric light before me. Then shutting my eyes, I can, without any effort, distinctly see the outlines of the glowing wires in a slightly fainter colouring. Keeping my eyes closed, the imaged wires, after some seconds, fade and disappear without changing colour; but opening my eyes onto a white sheet of paper I see the image again, but greyish in colour like damp white paper. As I try to fix it, the image moves upward, apparently because my eyes do so. If, however, I open and close the eyelids rapidly, with the gaze on the white sheet, I can see the fully coloured after-image on the paper. On blue paper I achieve the same result. As I move my eyes, so the image moves. Looking at the light and then directly at the sheet, I first see nothing; but slowly the image develops. Quick movements of the eyelids maintain and bring back the image for some little while.‡

Soon after rising in the morning—the eyes are then well-rested—I glance inadvertently at the dark green Venetian blinds, and discover a moment afterwards the positive after-image of those blinds on the wall to which my attention is casually directed. Repeating the observation deliberately, I note the following. I take a hurried glance at the blinds, shut my eyes and study the image. So faithful is it that I can count the number of laths in the blind, observe peculiarities connected with them, and read off points from the trees outside the window—a series of feats which I can perform with no ordinary image. If I open and shut my eyes rapidly and repeatedly, it becomes well nigh impossible to distinguish between the object and the after-image. Still, the brightness with me [*is it so with you?*] is not so pronounced in the image as in the sensation, and the detail also is limited. [*Is it so with you?*]

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[*] The word After-image is far from being a happy one. After-sensation would be more correct, except that this suggests a close correspondence between the sensation and the image which does not exist. Perhaps after-event would be least objectionable as a name for something which, in its pronounced forms, has no apparent purpose to serve in the world's economy.

[†] Helmholtz (*Handbuch*, 1886-96) says that experiments, if prolonged, are dangerous to eyesight, and I can testify to this. Observations should be spread over a considerable period, and should cease at the first sign of ill-effects (*ibid*, p. 502).

[‡] "Positive after-images are those in which the bright portions of the object are bright, and the dark portions dark; whereas negative after-images are those in which the bright portions of the object appear darker, and the darker portions brighter" (Helmholtz, *Handbuch*, 1886-96, p. 503). An exposure of a third of a second is sufficient to obtain the former, and one of several seconds to produce the latter. To experiment successfully the eyes should have been kept shut before starting and protected from the light for a few minutes (*ibid*, pp. 503-6).

One fine day, about 3 p m, I was engaged writing. As the paper showed faint patches which I usually connect with after images, I began to open and shut my eyes repeatedly with my glance fixed on the patches. Then, almost without warning, I saw on the paper the field outside the window, the trees close by, and the sky: everything in such complete detail as to form and colour that the sight unnerved me for the moment. This was unfortunate, as my observations were thus cut short. Such cases certainly suggest that *observation and re collection are theoretically photographic.*

(2) *The Complementary Image.**—Gazing at a piece of blue paper, placed on a sheet of white, and then looking at another portion of the sheet, I see the image of the blue piece in yellow. Again, sitting with a *red* table-cloth in front of me and a lamp with a *green* shade on it, my eyes, on accidentally travelling to the ceiling, are confronted with the image of a *green* table-cloth and a *red* lamp shade. I notice here as in (1) that details are observable in the image which were not in the first instance definitely developed, *i.e.*, which fell outside the focus of normal observation. The student will, of course, experiment with various colours, and record the results with the object of ascertaining the general facts Hypotheses should not be indulged in, nor should the memory be trusted Experimental examination, always supported by careful and exhaustive notes made at the time, should yield the compressed statements or general facts which are the goal of science

(3) *Monocular and Binocular Vision* -Looking with one eye at a picture where the relief is well imitated, we are surprised to find the picture unmistakably displaying the third dimension of space, depth. [*Test this statement.*] This is especially remarkable when we observe monocularly a coloured lime light picture here the sense of reality is irresistible As we shall see in sec 182, vision, whether monocular or binocular, gains its principal item of depth from the lines and surfaces seen by the eye. This general truth may be illustrated as follows. I look along the edge of a sheet of note paper [*Repeat this*] With the right eye open, I see more of the right side of the paper than if, the head remaining passive, I looked at that side with the left eye, and so with the left side, and the alternate use of the eyes. Hence either of the eyes necessarily sees less in this case than both eyes together used alternately, and it will, therefore, repeatedly happen in monocular vision that, owing to certain lines being invisible, depth will disappear. In many instances, however, the exposed surface does not alter with binocular or alternate monocular vision, and then, as the case may be, depth will be equally seen or not seen, as in looking at the furniture of a room. Fundamentally, then, the principles of binocular and monocular vision are alike, the exposed surface guides the interpretation. It is in this way that the realism is introduced [illegible] the lime light scene, *i.e.*, the single eye accentuates the lines which mark relief

Binocular vision, still using the sheet of paper for illustration, yield the two images given by the alternate use of the two eyes. Striking a compromise, it gives *a dimmed view of either side, slightly blurring what the neighbour eye cannot apprehend, and toning down the picture common to both eyes,* thus yielding in a *single* picture, more than either eye and less than both employed alternately. Neglecting for the moment the disadvantage, the advantage of binocular vision is obvious. With both eyes open, *since the eyes are some distance apart,* both side surfaces of the paper are partially seen, thus giving depth to both sides, whereas in monocular vision, one side only being seen, depth is abolished on one side. Consequently, while there are complications when the closing of an eye is necessary for the observation of depth, yet, generally speaking, monocular vision will be far inferior to binocular vision. In practice, indeed, there are innumerable occasions when an object is unknowingly within view of one eye alone as when, in writing, the right eye sees the right arm and the left eye the left arm. So also in looking out of the corner of a window where *part* of what is observable is seen only by one eye, there seems no appreciable difference traceable when I see the people pass from the binocular field into the monocular one—not even when I deliberately experiment.

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* "For the purpose of observing them, place coloured papers on a grey [illegible] your eyes a definite point of the coloured paper, and then suddenly draw it away," not moving your eyes (*ibid*, p. 516)

The stereoscope, invented by Wheatstone shortly before photography became a fact, admirably illustrates our problem (Wheatstone, *Physiology of Vision,* 1838 and 1852). Our two eyes are, strictly speaking, two cameras placed at a certain distance from one another, and each camera, therefore, yields a partly different picture. If photographs, then, are to represent binocular vision with its two slightly different fields, they must be taken from two points of view; that is to say, there must be two photographic cameras employed at a distance similar to that between the eyes (or one camera taking an object from those two positions). In this case we shall have one photograph equal to the right eye view and one equal to the left eye view. The stereoscope, by making it easy to see the two pictures as one, thus supplies us with a single scene equal to one traced by two simultaneously acting eyes, and its results are *superior as regards depth in proportion to the greater distance between the cameras or positions.* Since, then, normal sight deals with a double picture, *no painting or drawing, however faithful, can exactly equal reality as seen with both eyes.* For example, if I hold a pencil perpendicularly a few inches in front of my eyes and look first with one eye, and then with the other, at a picture in front of me, the pencil occupies different positions in relation to the picture; or if I look through ordinary iron railings at a moving light out at sea with both eyes, the light never disappears, while looking with one eye only the light, owing to the intervening railings, constantly disappears and re-appears. [*Test.*]

If we gaze for a little while at the centre of a small circle drawn on a piece of paper, it will be noticed that the one circle gives birth to another. If we look at two or three circles, four and six circles respectively can be seen. Using, however, one eye only, the number of given circles is never augmented. What develops under an intent gaze is, therefore, always *twice* the quantity of what is before us binocularly. The fact underlying the above peculiarity of vision is that the ordinary circle seen by both eyes together, is made up of two circles seen and blended by the two separate eyes. It is curious to observe how very far the process of blending, which lies at the basis of binocular vision, proceeds. For example, looking through a stereoscope at two real watches, one with and the other without "second" face, I find that now the figure VI is seen, and again the "second" face. Thus very irregularly drawn simple squares, etc., appear as regular, the irregularities being driven out of the field of sight. Again, two photographs of an object, taken *sixteen* inches apart, are, I find, still seen as one stereoscopically. Hence it will be seen that the two slightly different pictures given by the two eyes readily blend into one. [*Repeat the above with variations.*]

Binet (*Du Raisonnement*, 1886) holds that observing a colour, say, with the right eye (which is afterwards closed), the after-image is seen by the left eye (which is then opened) In this he confirms other observers, though it has been shown since that Binet was probably misled. [*Test.*] Titchener (*Ueber binoculare Wirkungen monocularer Reize*, 1892) fully deals with the problem The question of the monocular field of vision is discussed in Helmholtz's *Handbuch*, on pp 669 741, and the nature of the binocular field, on pp. 841-915.

Helmholtz enters exhaustively into the issues raised in this section. The following may also be consulted. Le Conte, *Sight*, 1881, Berry, in *Brain*, 1884; Franklin, *The Bearing of the After-Image*, 1894; and Franz, *The After-Image Threshold*, 1895, and *After-Images*, 1899. For a class test, see Spencer, *Psychology*, 1890, i, p. 112. See also Ebbinghaus, *Nachbilder*, 1890; Rollett, *Subjective Farben*, 1891; Hess, *Nachbilder*, 189[illegible], Washburn, *The White Light After Image*, 1900; and Gillette, *Notes on After-Images*, 1899

126.—INTUITIONS.

What we remarked of the visual field in sec. 118, holds of re-development in general, for all re-membered, as all pre-membered, events fall short of possible completeness. This leads us to consider a series of curious instances

One day, looking at a robin, it suddenly occurred to me that his appearance suggested a hunchback. This feeling, if it was a feeling, had been long with me without being recognised or connected. There was something unclassed—not even imaged as unclassed,—some sort of uneasiness besetting me, before the doubtful twilight—scarcely distinguishable from the darkness of the night—gave way to a flood of light. I am not sure whether there was present on each occasion anything which could be classed as visual, audile, motile, emotile or mental. Probably a visual as well as a motor factor existed. But, as I write, the visual element is so faint that I am not convinced of its actuality. I also trace a slight tendency to lift the shoulders,* if it be not rather a summary feeling connected with observing hunchbacks. It appears that extremely dim images, or apologies for images, are often with us without being distinctly recognised as such. [*Find similar traces in yourself.*] They are comparable to the effects of a breath of wind on the waters where the ripples are so minute that we are not sure of observing them.

Again, I am on a visit in the country. I meet some one there who challenges my attention, and whom I often see and think about. I consider him interesting; I like his face. Returning to town I accidentally encounter an acquaintance. Instantly I detect a resemblance between the two. The mystery is solved, *i.e.*, familiar chords were secretly touched. Mine was an erroneous interpretation. The likeness attracted me, and I made unfounded surmises. Familiarity was translated into attention, interest and admiration. In this case more than in that of the robin, I am convinced that a tolerably clear image haunted me.

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* Galton (*Inquiries*, 1883) refers to these dramatising exhibitions.

Two important lessons may be learnt in this connection. First, familiarity is often misinterpreted as being some other fact, whence arise serious likes and dislikes which sometimes bear momentously on life and character. We are liable, through this source of error, to blunder on many occasions. The ogre becomes a saint; the saint an ogre. He who is uninteresting becomes admirable; he who is admirable, indifferent. A lofty notion is laughed to scorn; a mean one is lauded to the skies. Once the origin of the delusion is pointed out, there is a probability that we shall, to some extent at least, protect ourselves against its unsettling influence by the closer scrutiny of primary and secondary combinations.

Secondly, men often say that they "intuitively" judge of things, notions and characters. They glance, for instance, at somebody, and they fancy they can read his thoughts. The subtler class of memory we are discussing explains these pretensions. We see the face of a particular individual whom, for certain definite reasons, we dislike; we meet another of similar appearance, and we dislike him, too. Connected or conscious re development being absent, we attribute to an occult power what is explicable on a rational assumption. If the judgment, in this connection, is acute, the consequences will, of course, be far-reaching; for we quietly judge from class to class, a similar feeling is aroused—usually without its corresponding image or with a dim image—and we pronounce accordingly. It does not require stating that *the vast field of so-called intuitive or immediate judgments falls under this portion of our explanation.*[*] [*Observe such cases.*]

Only yesterday a dish struck me as very palatable, and I consumed it with considerable pleasure. It never occurred to me till afterwards that unnoticed familiarity lay at the base of the particular delight. In this fashion, snatches of a melody haunt us, and yet elude us. There is something present; but we cannot tell what. It is perhaps the swing of a tune, or a peculiar feeling connected with it or the image of the instrument on which it was played. Perhaps that something has no relation to the melody at all. [*Carefully analyse this class of instances.*]

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[*] "Truths, which we well know to be results of complicated and highly mediated trains of thought, present themselves immediately and without effort to the mind of any man who is familiar with the subject. The mathematician, like every one who has mastered a particular science, meets any problem with ready-made solutions which presuppose most complicated analyses; and every educated man has a number of general views and maxims which he can muster without trouble, but which can only have sprung from frequent reflection and long experience. The facility we attain in any sort of knowledge, art, or technical expertness, consists in having the particular knowledge or kind of action present to our mind in any case that occurs, even we may say, immediately in our very limbs, in an outgoing activity. In all these instances, immediacy of knowledge is so far from excluding mediation, that the two things are linked together,—immediate knowledge being actually the product and result of mediated knowledge" (Hegel, *Logic*, trs., 1892, pp. 129-30).

The whole question of obscure secondary units requires to be carefully elaborated.

The presence of imperfectly identified systems often explains what would otherwise appear anomalous. Speaking of American generals, one of a company referred to an American general of high standing whose name he had forgotten, but who, he re-membered, was of German extraction. Later on in the conversation the name transpired, Sherman. The origin of the notion that Sherman was of German extraction becomes clear when we place two words alongside of each other: Sh*erman* = G*erman*. Thus what is obscurely suggested by one's own unrecognised failings frequently gives rise to strange opinions, *e.g.*, a conceited man marvels over the conceitedness of others, one who stutters considers persons who stutter objectionable, one who is always repeating a story takes exception to others who act in this manner, one who is hysterical is critical as regards hysterical persons, and so on. For this reason, if an individual's words or appearance dimly suggest some line of thought, we follow that without suspecting what determined our course of action. To take a somewhat extreme instance. Some one speaks German so fluently and correctly that few detect his non-German origin. There exists, however, a just perceptible difference in his manner and speech. Vaguely influenced, Germans tend to speak to him about international matters, and that sometimes in a tone anything but flattering to non-Germans. Hence we may generally conclude that what we are and what others appear to be, determines our conduct and reasoning to an appreciable extent, although we may not be quite clear at any time as to what is the determining factor.

127.—ORGANISED RE-DEVELOPMENT.*

We wish to know how we may distinguish generally between pre-development and re-development. Let us analyse a series of examples.

I was out for a walk yesterday. Passing by a villa, I said to myself, "Here lives M." How did I arrive at this conclusion? I looked at the entrance in an idle way, when, the eye easily gliding along, there suddenly evolved a certain feeling. I then muttered: "Here lives M." What made me draw the distinction between this gate and other gates? There are several counts in our answer. [*Analyse such an instance.*] (1) The attention was easily satisfied, and organically there evolved (2) a certain feeling, and that again evolved into (3) a rapid and intelligent survey of the object. These states were followed, on the ground of organised reaction, by the announcement or feeling of recognition. Looking at the next gate, after passing M.'s house, none of the above states are repeated.

I am asked whether I can re-develop a certain verse, and I reply, "I will see." I then unhesitatingly repeat the lines, and say that I can re-develop the verse. Why do I assert this? Could I not have spontaneously created the lines, or did they not perhaps arise like a gust of wind? I answer that whenever anything is developed like that portion of a poem, the assertion of recognition organically succeeds. A statement to the contrary effect is resisted and dismissed, or else we feel bewildered.

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* Gratacap (*De la Mémoire*, 1866, p. 252) writes: "To remember is nothing else but to conceive and recognise that which we have on former occasions perceived; now the faculty of conceiving and recognising that which we have already perceived is derived solely from the power which we possess to associate diverse ideas among themselves; and in turn, the association of ideas depends exclusively on the power of contracting habits, which is the property of the principle of thinking." Memory is only a habit".

Normally we can also test ourselves and others, so as to settle the fact at least for practical purposes. If we do so, we find that we cannot fabricate verses, tunes, etc., at the dictate of the fancy. All those systems which were membered would appear as connected with some event in the past.

Repetition on a large scale is exceptional. Usually I should say Yes or No to the question as to whether I could re-develop a certain verse. On what would such an assertion be based? Let us take the Yes and the No answers separately, since the problems involved are not the same.

(1) Suppose I assent. Four reasons, perhaps more, account for that reply.

(*a*) Perhaps I have often been asked this question; in which case I should organically say Yes, the question and the answer forming one complication. Such an answer would, of course, follow immediately.

(*b*) Perhaps a certain feeling develops, to which, under the circumstances, there is organically attached the notion of the possibility of re-development.

(*c*) Perhaps, to assure myself of the possibility of re-development, or for other reasons, I re-develop a line or just a word.

(*d*) Perhaps I think of some circumstance which warrants my assenting, *e.g.*, I clearly re-develop the fact that I recited the verse last night.[*]

Such re-development, though indirect, would be coupled with a prompt affirmation. In these four instances much uncertainty prevails, for though we do not usually re develop anything completely, yet our judgments are generally based on such partial re-production. We have ordinarily no time to test our memories, the tests themselves being organised; we hurry on. Mistakes are, therefore, not infrequent The organisation of thought into trends simplifies re-development to the utmost, even at the risk of occasional mistakes, and accounts for the rapidity of thought and action.

(2) Suppose I dissent. Here is an expression to the effect that nothing can be re-developed. The grades of such negations are many.

(*a*) I dissent because I have often dissented, question and answer forming one complication.

(*b*) Some one asks: "Have you visited the cathedral at Sienna?" I rejoin instantly. "No," the answer assuming shape while the question is being uttered. Had he put "Milan" in the place of Sienna I should as readily have said Yes. The reasons which induce us to affirm we have discussed. In the case of Sienna, no affirmation, no feeling expressing familiarity, no vague state, no defined images are produced; and so, in accordance with established trends, I promptly say No.

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[*] "There is a state of mind familiar to all men, in which we are said to try to remember. In this state, it is certain that we have not in the mind the idea which we are trying to have in it. How then is it, that we proceed in the course of our endeavour to procure its introduction into the mind? If we have not the idea itself, we have certain ideas connected with it. We run over those ideas, one after another, in hopes that some one of them will suggest the idea we are in quest of; and if any of them does, it is always one so connected with it, as to call it up in the way of association. I meet an old acquaintance, whose name I do not remember, and wish to recollect. I run over a number of names, in hopes that some of them may be associated with the idea of the individual. I think of all the circumstances in which I have seen him engaged; the time when I knew him, the things he did, or the things he suffered; and, if I chance upon any idea with which the name is associated, then immediately I have the recollection; if not, my pursuit of it is in vain" (James Mill, *Analysis*, 1867, i, pp. 322-3). A strange thing is not uncommon with me. I know a certain name well; but I am unable to re-develop it readily. I call up the man's correspondence; but his signature eludes me. I think of him as being spoken to; and all to no purpose. Here we have a temporary gap, an unmistakable vacuum, a partial blindness of the soul.

(*c*) In my endeavour to answer I may have tried to re-produce, but failed. In such instances, the field of attention is practically annihilated (sec. 30). [*Test this yourself.*] I cease breathing for the moment; there is a felt strain in the head, similiar to a strain in the muscles of the arm, which lasts for a few moments. Then, nothing of the desired nature having developed, I organically reply No, for to the state of unsuccessful effort is attached a negative answer.

(*d*) I think of some circumstance which warrants my dissent.

(*e*) I am perhaps not sure whether I re-develop what I am asked. In such an instance, we have undefined feelings. Whenever such thought feelings, *i.e.*, feelings of doubt, belief, incredulity, etc., haunt us, the interpretation suggested by general observation is that nothing reliable can be affirmed, and hence, in agreement with organised reaction, we speak accordingly. What is true of doubt or semi connection, is, of course, true of certainty or perfect connection, belief or partial connection, and the intermediate stages between full assurance and disbelief. To take the question of belief, we do not say we believe that we are able to re-develop a system when the conditions point to semi-connection or uncertainty, or disbelief or counter-connection, or when there is every sign of recognition, or when every such indication is lacking. Doubt is a state of indecision, and is, therefore, not confounded with belief which indicates partial justification (sec. 99b). [*Experimentally induce states of doubt, belief, disbelief and certainty.*]

128.—NOVELTY AND FAMILIARITY.

I have referred to re-membrance and its denial. To obtain a completer analysis, we shall consider the meaning of novelty. I pass by a house in London on the door of which is a brass plate which I glance at, and read "Bezirks." My reading is slow, unintelligent and deliberate, evidently requiring more time for development than would a known term. Suddenly it dawns on me that the syllables are German. The word proper shoots now into the light. [*Analyse such instances.*]

While I attached no meaning to what I read, (1) I proceeded slowly and planlessly; (2) a peculiar feeling of groping was present; and (3) nothing related to the word on the brass plate was re-integrated. When a meaning suggested itself, (1) the word was re-formed at once and intelligently; (2) there was a feeling of ease; and (3) there were dim memories connected with the word. To the former state we organically attach the notion of novelty; to the latter that of familiarity. In novelty there has to be, broadly speaking, assiduous attention; while in what is familiar, there is light re-attention; hence the lesser quantitative effectiveness in novelty. We enter St. Peter's, we will suppose, for the first time. The loftiness, the spaciousness, the many-coloured marble pillars, tombs and altars, the huge masses of sculpture have a bewildering effect. The attention is captivated wherever it turns, and nothing awakens memories except of other places. This is contrary to what would happen if our business called us there every day." Another example is readily forthcoming. We regard the stately columns of the British Museum with wonder and with awe. It is the first time we have seen them. The entrance hall with its treasures also charms us. Time passes, and we frequent, as students, for months together the historic Reading Room. Neither we, nor the body of readers, seem aware of anything striking or beautiful in passing in or out. Everything touches the threshold of indifference. We have become familiar with the place. The attention has been satisfied—allowing for a mean ideal—and seeks for new materials. Novelty, then, has its defined conditions.

Experimentally looking about me, I learn that, to a large extent, everything is familiar, and nothing wholly novel. What has, therefore, been said above, implies intimate or interested familiarity on the one side, and tantalising semi-novelty on the other.

129.—The Gaping Void.*

"What is the French for 'slipshod'?" some one asks. I answer that I have the word on my tongue, and that I am sure I know it. [*Examine such instances.*] Again and again I feel it nearing, as one feels the approach of the sunshine, and again it vanishes, as if the sun were sulking behind a cloud. I seem to be chasing the word as a bird chases a butterfly. What is this haunted thicket, this whirlpool which will not let us rest; this mixture of certainty and ignorance? After the expositions of the last chapter, and after what we learnt in the preceding sections of this, little requires to be added. These harassing combination feelings hold the word wholly or partly in solution, the problem being the method of precipitation. The various changes in these obscure feelings are significant, and as for the interpretation, organised reaction sees to that. Such feelings are normally accompanied by re-development, and that is why we presume to know. Along with *B*, a system re-developed, there has nearly always gone *A*, a certain combination feeling. Re-developing *A* and then *B*, there gradually develops a feeling of confidence that where *A* appears, *B* will follow. The circumstances alone define the meaning of the feeling. Its quality does not differ from that of other feelings which are differently interpreted with different circumstances.

Re-development is frequently partial. We are unable to re-instate a person's name, but we feel assured that the first letter of that name is G. [*Keep notes of such instances.*] Thus wishing to think of "scone," I am certain that it resembles the word "stone"; so also the nearest approach to "tincture" is "cincture;" similarly the name "Lockroy" is the nearest approach I can make to "Cowderoy." A study of imperfect re-development ought to form a stepping-stone to the discovery of some of the chief problems in memory. It certainly is remarkable, that desiring to re-develop one word, we should re-develop another with a similar sound, and feel that the word we are angling for bears some resemblance to this. Where the hitch lies it is difficult to determine. [*Experimentally teaze your memory for proper names, and note results.*]

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* See James, *Psychology*, 1890, i, pp. 251 ff.

Finding it difficult to recall the name of Plutarch, I determined to insist upon re-developing that name for the purpose of watching its emergence. I felt sure that the name began with *P*, or probably, *Pa*. I then deliberately re membered names beginning with *P*; but in vain. I thought of his writings and his life for the purpose of seeing whether these would suggest the name; but without success. For three quarters of an hour the problem incessantly recurred, and in such a way as to prove beyond a doubt that the recurrence was due not to association but to recency alone. I then sat down to enter in my note book the history of the attempt. The first words shaped themselves as follows: "Have watched a case of . . . Plutarch." When I came to "of," I found it hard to describe the kind of case, and the suspense lasted only two or three seconds before the name sought for developed—out of nothing as far as associations are concerned. [*Experimentally vary the above.*]

130.—THE PART STANDS FOR THE WHOLE.

Events in normal thought are not re instated in their entirety. A certain individual has a peculiar gait; he shuffles about, he walks rather hurriedly; or he mumbles while abroad; and that detail is all we generally re-develop of him. Ordinarily, therefore, we picture an object only in part, while the summary feelings which accompany the image do the rest. Imaged events must generally be interpreted in this manner. In thinking, for instance, of a procession, the banner bearer, with the re-developed feelings, forms the substance of what is re developed, or we obtain a glimpse such as haphazard photography yields, though without its completeness and clearness, or the corner of a banner, or some accidental circumstance, is pre-developed. The tendency, in harmony with ch. 3, is to re-instate the *minimum* and to suppress what is superfluous. Generally speaking, as far as events are concerned, it is correct to contend that we re-develop only fractions of them, and that these are determined in the first instance by any trifle which chances to challenge our senses.

131.—WHY THE MEMORY LEANS FORWARD.

When we have once learnt to read from left to right, we find it hard suddenly to reverse the process. Omitting secondary considerations, the explanation is simple. While we look at the first letter, we already organically adjust ourselves to read the second. [*Observe.*] The process of spelling letter by letter is, therefore, not a pure step to step process; and when we accordingly attempt, without practice, to read backwards—there being no organised tendency to move to the left, and a strong one to move to the right—we necessarily meet with difficulties. Of course, as we might expect, practice soon does away with the difference between forward and backward reading, so that after a little trouble, figures can be read in either direction with equal facility. [*Test this.*] What has been asserted of reading holds true generally. The order of re-collection is psychologically indifferent, and dependent on usage. The reason that we normally re-develop in one order, is equally obvious. Our brains are no playthings, and the central nervous system, having seriously to deal with an environing order which is tolerably stable, is, therefore, itself uniform in its reactions. Where, for whatever reason, a divergence is sought from an established order, there the diversity is obtained.* [*Change the order of re-collection.*]

Of late, as previously mentioned, I have been learning a phonetic longhand. While I can almost instantaneously picture words and letters in our ordinary writing, I was unable at first to do more than slowly re-integrate letter after letter of the new alphabet. Gradually the power grew, and by the time I had written one letter I re-collected its successor. I strained in a forward direction, the attention being expectant. In reading, too, I had at first to attend to each letter for an appreciable period, and when I had deciphered one letter, I strained for the next. As I grew expert, the forward tendency became marked. I rushed along the letters, like a flame along a string of gas-burners which automatically light each other. Later still, there were attempts to guess at a word from its general appearance, and this last stage seems to prove that we do not ordinarily decipher in succession every letter in a word; but that we first guess at a letter, and at last at words and familiar sentences. It will be good practice for the student to learn about ten consonants and three vowels of a shorthand system, and determine the appearance and disappearance of various images. As an experiment in organised reaction the meaning of the characters might be changed after they are thoroughly learnt.

132.—VIVIDNESS IS NO TEST OF OBJECTIVITY.†

I look at a book which lies before me [*examine a similar instance*] and also analyse the image of the waves dashing against the concave sea-wall at Scarborough. Which is the reality? Or are both memories? Or are both primary systems? I decide that the book is real, and that the curling waves are only re-developed. But on what ground? I do not do so because of greater vividness alone. Again and again my imagination is as vivid as the reality [*is yours?*], often even more so. An image of a moon-lit night or a landscape at noon looks far more brilliant than a momentary vision of a room by candle light or a road in foggy weather. If I re-develop things which I know well, they appear as they do when I am face to face with them. Rooms that I am thoroughly acquainted with look to me [*do they to you?*] as real in secondary as in primary observation. There is no veil, no semi-transparent film, drawn over the image. So also when I glance at a passer-by I immediately afterwards re-develop his image with the full vividness and detail of the primary life. One difference between primary and secondary systems lies in this, that I can freely fix the book for many seconds; I can observe innumerable fresh details; I can apprehend the action of many forces on the book; and I can read page upon page of new matter. Again, whatever I notice round the volume is equally distinct. It is not so, however, with the sea-piece. Scarcely do I attend to it, when it vanishes. I cannot discern minute details, walk along the shore picking up pebbles, measure the road, or scan people's faces. Detail is practically absent, and the secondary or memory environment arouses feelings and images such as I connect with re-development. The collateral pictures come intermittently and possess no freshness. Though I know the waves to be quivering, I yet see little or none of this. The feelings of active observation are wanting. Glancing at an object for a moment I only discern certain features, and these alone can naturally be detected in re-development. Continued exploration of the image does not yield fresh items, while continued scrutiny of the visual field gives rise *of necessity* to new points. In dream life (sec. 229), this effect is achieved by imagining fresh details. If we could freeze what we see at a particular moment, our eyes would be, as in secondary vision, incapable of dwelling on the object for more than a short time, and there would be, in consequence, no continuous flow of information. I can, however, fix an image when I think *about* it, or when the attention is otherwise engaged.

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* See Ebbinghaus, *Ueber das Gedächtnis*, 1885; also Bradley, *Why do we Remember Forwards and not Backwards?* 1887; and specially Ward, *Psychology*, 1886, p. 61, footnote.

† The following two points must be borne in mind in reading this section. There is first the question of the "simplest case" (sec. 136). I travel by night, and, looking out of the open window of the railway carriage, I see a single light. Except for my awareness that I am in a lighted compartment, and the fact that I cannot dismiss the light at will, there is no setting. So, sitting in a wood, I hear the occasional bark of a dog in the distance. Here there is virtually no aural setting. In such simple cases as those here mentioned, we have the nearest approach to primary sense affections which are indistinguishable from secondary ones. The incontrollability of the former and the lack of the power of dismissing the sound remain almost our only guide. If we are at all absent- [illegible] The second point is also an important one. When I am actually at the sea-side, I not only see the waves, but I hear them; I smell the charged air; I feel the wind. In re-collection, however, almost everything except the visual factor is ordinarily eliminated (sec. 120).

In re-development the re-instated object generally appears without appreciable environment. Looking at a street poster on a hoarding [*try this*] and then shutting my eyes, I re-develop the image of the poster and scarcely anything else. Yet when I observed the original, a quantity of other objects, progressively less defined, fell within my view and freely changed as I altered my visual position. When the place as well as the re-developed object is familiar, the surroundings are re-developed and the object appears set in a proper frame; but even then our spiritual sight cannot readily range as in normal observation. Ordinarily the attention expended on viewing the setting is probably not sufficient for the purposes of re-development, while at the same time, the frame-work being of no interest, we tend to ignore its existence. So when we see a friend, in many settings, the tendency, in primary as in secondary development, will be to suppress, to ignore, and, therefore, to forget the settings. (Sec. 69.) Either the absence of a frame, or the mechanical presence of one particular one, tends to confirm us in our implicit judgment that we are dealing with a secondary and not with a primary system. The more we experiment in this direction the greater appears the divergence in this respect between normal memory and normal observation—the former being without and the latter with a setting. Also, when we re-develop a scene with our eyes open, as they normally are, the image is checked by the systems we are deriving from our surroundings, systems whose richness strikingly contrasts with the poverty of the image.[*]

I conclude, therefore, that the book is external, but not the waves. Organised reaction settles the matter in practice. I could write down what the image of the sea yielded, go to Scarborough, and compare my notes with the reality. How feeble the former would appear when brought face to face with the latter. We do not, however, wish to make the journey. I, therefore, shut my eyes, with the book still in front of me. I then open them and commit to paper the information gathered by the thought of the volume. Then I study the book itself, copy some pages of it, compare the notes and find how inexhaustible the primary world is when contrasted with the secondary world.[†] (See also sec. 124.)

I notice that what is re-developed immediately after pre-development, is most vivid and detailed, besides being accompanied by a kind of memory feeling, while as the span of time widens vividness and detail diminish very considerably. In the latter case we tend to confound imaginings and others adventures with our memories. Suppose, for instance, that I re-produce a short sentence from a book. In reading for the first time the cluster of words, I see, however dimly, its immediate surroundings. When the re-development is recent, I actually feel these surroundings. I also see the white, shiny, smooth paper with the sentence visible on it. Gradually the detail disappears: feeling, whiteness, shinyness, smoothness, printed letters, ease of re-development and, lastly, every vestige of the sentence. Stout (*Manual*, 1899, p. 402) supports a different solution; he says: "The percept has an aggressiveness which does not belong to the image." So also Ziehen, *Leitfaden*, 1891, pp. 96-7. Some weight must be allowed to this distinction; yet the very difficulties of the memory problem show that sensory aggressiveness is an unsafe guide.

The range of sight or hearing is the same outwardly and imaginatively; in fact, the latter is a copy of the former. In secondary speech I note the same pauses and changes of tone as in ordinary speech, though sounds are frequently slurred. [*Examine.*] In secondary sight I observe the same method as in ordinary sight, of turning at a certain time rate from picture to picture and from one part of a picture to another part, while the images are re-developed in the positions in which they were originally studied. Often, indeed, the secondary time rate is slower than the primary time rate. [*The subject of this section should be carefully determined.*]

Egger (*La Parole Intérieure*, 1881, p. 69) considers inner speech to be quicker than ordinary speech. That may be so under special circumstances; but is not otherwise borne out by my observations. As to the the spatial position in which images are re-produced, experiment, as well as see Giessler, *Aus den Tiefen des Traumlebens*, 1890.

133.—THE PRESENT ENDS WHERE OBLIVISCENCE BEGINS.

We have assumed a present and a past. What happened in the present, we called reality; what we referred to the past, we named memory. What do we mean by the present? What constitutes the past? The answer to these questions is not self-evident. When my eye travels across a landscape for one second, is not the observation of the first moment passed before that of the second moment arrives? If so, as we have already stated in sec. 107, does not all observation, with the exception perhaps of a most insignificant portion, imply memory? Is there such a thing as a discrete moment of time? And, if so, can anything be observed within such a span? I do not discern anything when an object is quickly passed before my eyes. Is then all discernment a question of memory?

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[*] A similar effect of reality is produced by the dark field of vision when my eyes are shut, and just before waking my imagery is day-like in vividness.

[†] See My except the *arative Psychology*, 1894, pp. 103-5.

The more we consider this point the more evident it becomes that the psychological Now must not be taken ideally. Let us examine this Present of ours. It is not a bare moment, for such an one is inconceivable. It is not the shortest strip of time imaginable, for in such a space we can observe nothing. The psychological reply must be founded on what was stated of the first degree of obliviscence. *For some seconds or minutes (sometimes for some hours or days when particular aspects are concerned) our memory is thoroughly trustworthy and complete, and this period limits the present. We live in the Now while we can re-instate details with extreme freshness and ease.* Hence with a perfect memory, if we ignore the position of the systems in the total thought series, the Past is swallowed up in the Present. No other definition is possible. The question you put, the hollow echo of which the empty hall still caresses, is it a dream, was it delivered now or twenty years ago, or was it uttered at all? Normally we are not perplexed. We answer the question as if it had been asked this moment. (See, however, sec. 124.)

The Present, then, is the arena in which we fight out the problems of objectivity and memory. Here we experiment—now pre-membering, now re-membering. On the above description we normally stake our belief in the distinction between what is observed and what is re-produced. When what we scrutinise has one set of signs accompanying it, we call it observation; when another, memory. This is the sole meaning we can attach to the difference. We possess no other solution of the riddle.

I am asleep and dreaming that I am on one of the Boulevards in Paris. I reason with myself that this is impossible, that I must be dreaming. I only went to bed just an hour ago, and how then can I be in the French capital? No conveyance exists which could transport me so swiftly. I *must* be dreaming. I try to settle the question by an appeal to the senses. I observe the breadth of the pavement; I see the restless double stream of people; I look in at the shop windows; I touch the chairs of a Café; and I listen to animated conversations; but still I doubt. After some further display of scepticism, I at last agree that I am in Paris. In the morning I wake and discover my mistake. Was I dreaming? A Chinese philosopher is said to have dreamt that he was a butterfly. Which was the dream form, he mused, the human figure or the dainty creature all wings? We wisely decide, for our sanity is dear to us, that he *dreamt* of himself as a butterfly. We could possibly convince him, that the dream imagery only imposes on a weakened judgment, and that the resemblance to reality is feigned.

I have concluded the discussion as to what points to the Present and what to the Past. It is true we have encountered no absolute boundary line except that attained by the method of localisation in a series; but we have discovered what makes us ordinarily distinguish between the various degrees of memory and reality. Familiarity, supported by organised trends, has supplied us with the explanation. Memory is not simple, it is distinguished under ordinary circumstances by a definite but large variety of landmarks which serve as guides. If these play us false, then what security is there for anything? We do not envy the sceptic who holds that all distinctions are untrustworthy, as they certainly are sometimes.[*]

134.—The Dynamics of Memory.

(1) *We do not Re-develop Everything*.—Memory approaches perfection for a second or two alone, and only among fabled creatures, therefore should we think of finding any one who freely re-developed everything and in perfection. Who can, on being challenged, recite a volume of eight hundred pages after a first reading? Who can count in memory the number of pebbles he has seen on the sea shore?

The statement with which the last paragraph was opened demands rectification. It only holds when we are anxious to re-develop, or are not pre-occupied. While humming a song we perhaps fall into reflections and become oblivious of what we are doing. We perhaps leave off without knowing it, quite forgetful of our singing. For example, I re-collect that I have read but a moment ago the word "Tailor" on a sign board, and yet I have not the remotest notion where I read it—whether to my right or to my left, far ahead or near by. [*Collect and analyse such cases.*] In simple organised activity such forgetfulness is usually the case, and thus we do not even for a second re-develop what we have been engaged in. As soon as a step is completed, an object seen, or a sound heard, they cease to exist for us, and especially is this true of systems which fall within the margin. In the routine of life we meet the same thing. Walking along the street most objects or noises are no sooner re-membered than they are lost to us for ever. Who can re-develop what he has read when his thoughts have drifted from the book? (Sec. 110.) [*Test the statements, more especially the last one.*]

(2) *Memory and Effort*.[†]—We have implied that only that is reproducible which has been attended to with a certain assiduity or interest.[‡] It is equally true that ALL ORDERLY, REMOTE AND EFFECTIVE RECOLLECTION REQUIRES APPRECIABLE EFFORT. [*Carefully verify this.*] The memory

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[*] The question of objectivity will be further discussed in ch. 8.

[†] Dugas, *La Mémoire Brute et la Mémoire Organisée*, 1894.

[‡] Locke (*Human Understanding*, bk. 2, ch. 10, sec. 4) speaks of cases where "ideas in the mind quickly fade, and often vanish quite out of the understanding, leaving no more footsteps or remaining characters of themselves than shadows do flying over fields of corn."

does not as readily empty its contents into the basin of thought as a river discharges its water into the sea. To re-develop what is appropriate, constitutes a task, especially when we are circumspect in our procedure. Our wandering private thoughts (sec 219), owing to the absence of necessary strain, tend, therefore, to be inconsequent and absurd. Thus, in a restaurant, having chosen a certain dish, I begin to think about a certain author. When the waiter arrives, I just escape asking him for "Mr. Smith" (sec. 229) [*Observe such cases*] In unspoken thought confused re-development is common, and is entirely the result of the absence of strenuous effort. In dreams, accordingly, where the neural tone is reduced re development is chaotic, and from this source and that of hallucinated reactions spring the universally prevailing originality and insanity of dreams (ch. 10). Normal re development, then, consumes a notable amount of energy. In a similar way, the production of every simile and turn of thought requires sensible exertion [*Verify this last statement*]

We have reached now the dynamics of memory Attention, in the first instance, must attain to a certain high degree if the subject is to be reproducible In monotonous activity or in the field which is furthest removed from the focus of attention, this degree is not attained, with the result that reproduction is there lacking It is almost superfluous to repeat that the absence of sufficient attention is accounted for teleologically Attention being limited, we are apt to attend least to what yields least organic satisfaction, and even paced routine, and all that falls without the focus, is of this unsatisfactory nature

We distinguish, broadly speaking, two means by which to obtain the requisite measure of assiduity First, we possess normally a definite amount of energy of which we must rid ourselves while we also have certain organised wants These wants, in connection with the pressure of energy, ensure attention of an adequate type for re development Secondly, we perhaps expressly wish to re develop I do not mean by this that we necessarily formulate our desire in so many words, or in any words, or that we harbour the explicit notion of wishing Usually, as explained in the last chapter, an organised feeling precedes re development In proportion as this feeling is obvious, or to put it differently, in proportion as we connect the notion of re-development with the process of re development, so *pari passu*, we remember the fact Also, the more transparent our aim, the more successful will be the result of attention, since lucidity implies that no labour is wasted in delay and idle search [*Test this statement.*]

Granville (*Secret of a Good Memory*, 1880) aptly emphasises in his little book the fact that where we wish to re-develop, there we should read with the notion of re-developing before us Experimenting along this line, I find that when I emphatically turn away from a subject as if I had done with it, it frequently ceases to recur. I have in this way, to my astonishment, dismissed news for a time which otherwise would have recurred moment by moment for hours. Usually we do not dismiss a thought like this; the excitement sensibly continues in consequence; and spontaneous or ready re-development follows I can, therefore, appreciate Mr. Verdon's remarks on forgetfulness, where he refers to the fact that we sometimes quickly forget (*On Forgetfulness*, 1877, p. 449. See also Stout, *Manual*, 1898, p. 96). Indeed, the difference between a good memory and a bad one will in this manner often be decided by the presence or absence of this factor. [*Experimentally test*.]

If special effort or tone, as is contended in this section, is a material factor in re-development, it seems to suggest that where, for any reason such as absence of practice, strain is absent, there a general memory will scarcely exist. From this it is but a step to the assumption that a *general memory hardly exists outside a developed society, and that, therefore, animals, like dreamers, re-develop almost nothing of a complicated character.* Arguing in this direction, we can see that the secondary world, as far as it is the reflex of the primary world, is probably a late product of evolution. At first we have simple contractility; then contact with the environment produces changes such as the hardening of the skin in those who are engaged in heavy work; then actions are re-developed in part, and, lastly, in this very crude plan, all happenings are re-producible in a desirable way, so as to form a mimic world,—a simplified model of the outer world,—by means of which we may forestall the future (sec. 137). (See Smith, *The Relation of Attention to Memory*, 1895.)

(3) *Repetition and Memory*. Another interesting fact now becomes patent. Repetition as such is no guarantee that an incident shall be engraved on the brain. In ordinary organised activities we repeat indefinitely, and yet altogether fail to re-develop the steps at will. Let us, however, leave such occupations on one side. Every one knows that when we are not interested in a subject, or when we do not make efforts at its development, we may mutter formulae for decades without being able to re-produce them freely. I have, for instance, frequently gone to certain numbered library shelves, and yet forgot their numbers until I made a special and decided effort not to forget them. So also in a building which I must have scrutinised hundreds of times, I only re-develop one small gate-way where there are two. It is also generally admitted that we succeed best in fixing what is to be re-developed, other things being equal, in proportion to the predominance of some interest or of some determined effort. In other words, the application of strenuous attention is a crucial factor in the dynamics of re-development. If we could apply all at once the energy which usually lasts us for several hours, we might re-develop a difficult proposition without any repetition; but this road is barred (ch. 2). In the Bank of Attention no thousand pound notes are issued. The maximum and minimum is a humble five pound note.

(4) *Attention Energy cannot be applied all at once*.—Repetition is normally necessary if we are to be able to re-develop an incident after a time; but repetition can claim no virtue of its own. It is required because we cannot make a great enough effort at one attempt. By repeating our attempts, we perform what we should accomplish at once if we had sufficient energy to dispose of at any given moment. It is exactly as when a man is told off to remove a cartload of bricks: he transfers a few at a time until none are left on the cart. As all bodily energy is one (sec. 34), so the explanation involved in dealing with the bricks holds good without any reservation for neural work. In memory, therefore, we require reiterated effort.

(5) *Effort must be Intermittent*.—When the bricks are in great numbers,

we cannot, owing to human limitations, keep on removing them without intervals of rest. In collecting material for the memory we, therefore, encounter a third factor—time, the first factor being a certain strenuousness of effort, and the second the necessity for repetition. We have already learnt (sec. 28) that persistent effort is exhausting; *i.e.*, that it paralyses that portion of a brain area which is affected. To repeat a theorem vacantly a thousand times a day will not assist us much. To reiterate it vigorously a hundred times a day would saddle us with an unprofitable headache. We must, therefore, vigorously repeat our attempts at not too close intervals. There is an additional reason for judicious pauses in that we are not able to attend for many moments together to any detail (sec. 29). If we think, then, of our subject in connection with other matters, we are distinctly employing added labour without tiring ourselves. We persist in repeatedly attending in the easy manner which we have found to be conformable to the nature of the attention (ch. 2). There is no safer method of memorising a matter than by thus thinking about it for hours, assimilating it with various systems. This is different from an isolated attempt to fix the subject, for thinking about a matter is in accordance with the nature of attention, while the latter method is not.

For what period, allowing for pauses, must we repeat? It will be found (sec. 112) that we must continue being familiar with a subject for many months—nearer a year than not—before we can be sure that the subject is at all well assimilated. The later reiterations must be at considerable intervals of days, or even weeks, rather than closely following each other, that is to say, a certain period must elapse independently of the number of vigorous repetitions. Now what relation does this new fact bear to the others immediately preceding? That the lapse of time by itself can do nothing only requires to be stated; but why must the moon pass so many times through its phases before we re-develop efficiently? The following explanation, which agrees with the ones which have been already offered, meets the case. First, a brain area can support little strain or drain; it is exhausted by slight effort. The prostration endures for some time, perhaps for hours; if very trying, for days and longer. In a previous section (sec 109) we saw how a strong neural excitement persists for many hours and remains in a weakened state some time after that. It appears, therefore, that we must allow a liberal margin between the repetitions. To avoid thinking of the subject is occasionally useful, for attention is most effectively employed after a period of quiescence. Work of any kind, when we are tired, benefits little. Secondly, pondering over a subject connects the parts and binds it to other themes. In such thought attention is spent with increased economy. We also know (sec. 2[illegible] we weary of subjects as we tire of details, and that consequently [illegible] not recur to them with ease. Lastly, when the brain is rested, when we are not burdened with the fancies of the preceding hour; when no irrelevant neural momentum is at work, pertinent systems are likely to evolve. On fresh thoughts we readily dwell; on those of the last hour attention has no power, for it has left them paralysed, with their connections cut. In cramming we have an echo rather than a memory of the facts.

(6) *The Old in the New.*—Still another aspect dealt with in chs. 3 and 4, may be here enlarged upon. Subjects are closely related to each other. If we are sufficiently acute, we can recognise much of the new—perhaps most of it—in the old, and in that case we need learn little or nothing by heart. In so far as such recognition takes place, our task is made bodily lighter, for we have so much less to con over; and if we think at all of the present in relation to the past the boundaries of knowledge are sure to be extended. It is a well attested fact that a detail is difficult to re-develop when isolated, though readily re-developed when connected (ch. 4). In such instances attachment to common notions is of signal service, since these notions are frequently and easily re-developed.

(7) *The Superiority of Observation.*—Our explanations emphasise a fact which might be considered exceptional, and to which we will, therefore, refer. We read in a paper of a great fire and very soon afterwards the news has disappeared from our thought. Had we been spectators, however, we should re-develop the occasion for a long time. The shouting of the firemen on the approaching engines, the mad gallop of the horses, the smoke and sparks issuing from the furnaces, the prevailing confusion, the house on fire, the spreading of the flames, powerfully appeal to us. Instead of attending for two minutes to one of several shadowy newspaper paragraphs, we live through a series of graphic events for perhaps two hours. When we leave the scene, the incidents, as noted in sec. 110, haunt us. The disturbed brain area repeatedly excites us to reflections on the subject. As a consequence a large quantity of attention is spent in a certain direction in a short time, and the event is readily re-developed. Were it our duty to attend fires, we should expend little labour in impressing on ourselves the incidents of a particular conflagration, and no event of that class would be re-membered for long. On the other hand had the house been our own, attention would have been prolonged, re-development frequent, and the images probably persistent throughout life. This example makes it obvious why observation is superior to hearing accounts or reading records of an event. More attention is absorbed in observation than in hearing accounts.

We read in a newspaper the story of some terrible earthquake. We hear of towns destroyed, of the deaths of thousands, of the horror and terror and privations of tens of thousands of our fellows. The whole of the news is contained in a telegram of a score of lines, yet we never perhaps forget the tragedy. The explanation is obvious. We do not read the account and then turn to another paragraph, not re-producing the calamity till two years later. On the contrary, we are deeply moved, and for weeks the thought, like a resisted temptation, comes and goes. Effective attention is here natural and simple, though it is impossible that in normal life everything should strongly impress us. In the latter case the nervous system would soon be prostrate. It verges on the absurd to grow excited over a

Latin irregular verb or over the date on which some petty monarch died. Nevertheless the absorption of the attention explains both sets of cases.

We have explained the re-development of remarkable events. A similar solution applies to a type of less obtrusive facts. On a walking tour in Switzerland we see and re-develop much. Glimpses of numerous scenes satisfy our love of wonder for years. A glance at a lake is capable of being re-produced ten years later. Here there is no apparent perturbation; but still that which is observed sinks far down. On the whole, this is but another special application of the use of attention. That which I noted touched me deeply; I recurred to it on many occasions; and only as the interest waned, did re-development cease to be possible.

One obscure set of cases our theory apparently fails to explain. Sometimes we re-develop an event very frequently, though it has no special interest for us. We are reading a book as we cross a meadow, and we casually notice the hawthorn hedge which fences it round. It has no traceable claim on our attention, yet now and then it is recalled. In this way, if we are observant, we often know that a trifling episode has come to stay with us. [*Can you trace such episodes?*] Many of our youthful and lasting memories are of this apparently meteoric and unteleological nature. We must assume that the neural mechanism is at such moments abnormally sensitive, or that the situation is in some other way unusual. [*Carefully examine such cases.*]

Another order of memories—a seeming exception—is readily reduced to rule. I read a book on Logic and easily re-instate its contents, and yet there has been little effort in the reading. How is it that I re-develop so much with so little strain? I answer that I had previously read a good many volumes on the subject. With most of the notions, terms and trains of thought in this book, I was acquainted from previous works. Only the new matter had to be attended to and that was scanty. Nearly my whole attention spread itself over a few scattered remarks instead of being occupied by every sentence. The better, then, we are acquainted with a subject, the more readily is it pursued (sec. 44). The reading of the book required little memorising. Even what seemed new was largely made up of what was old.

(8) *Child and Adult.*—It is easy to attend to what is new when it is shown to be implicated in what is old (sec. 44). Instead of re-developing a new fact, we only require to re-develop an old one in a slightly different dress. Hence we expend less energy in appropriating the fact, and we commit it more easily to memory. As we grow older, there is comparatively little to be acquired which is quite new, since one or more aspects are sure to be familiar. To the adult new truths are partially new. Thus we are apparently learning half-a-dozen times as quickly as a young scholar, when in truth we are proceeding at the same pace, or perhaps more slowly. In this way the groundwork of assimilated knowledge enables the pupil to progress at an ever-increasing rate of speed, and this makes it almost criminal to withdraw children from school while yet young. Accordingly,

though the matter which the child makes his own grows in complexity, the relative strain of attention as regards a subject, positively decreases, allowing for growing strength and interest. Any one who re-develops much, will with ease re-develop much more, while he who re-develops little, will laboriously add but a trifle to his store.

(9) *What has only Extension is Difficult to Re-develop.*—Some classes of statements are somewhat difficult to re-develop—at least for some persons [*is it so with you?*], and these appear to be such as have no evident relations. We re-collect without hesitation that the Wars of the Roses implied two roses, one white, the other red, and also the House of York and the House of Lancaster. Which rose, however, represented which House? White has no special affinity to Houses, or War, or anything else. Colour has no intensive meaning. When we describe one individual as good and another as bad, the adjectives suggest many details and cannot, therefore, be confused. If, on the other hand, I said: This man lives in a white house and the other in a yellow one, the case would rest on a different footing. White is but white, and yellow nothing but yellow. A man's goodness, on the contrary, points to a variety of concrete facts.

Take another instance. The differences between an acid and an alkali are manifold, and they could not be mistaken one for another. A litmus paper displays also a quantity of special characteristics. Yet a blue litmus paper, to the ordinary apprehension, is distinguished from a red one only in colour. Will dipping a blue litmus paper into an alkali turn it red? Or should it be brought into contact with an acid for that purpose? If the terms red and blue were restricted to the process we are interested in, no difficulty in re-developing would be felt. This, however, is not so. We constantly employ these as well as cognate terms for naming certain collective aspects of objects.

What is true of colours, is true also of figures. The latter have no contents, beyond the quantity they indicate. Thirteen men, thirteen circles, thirteen ideas, mean just thirteen, nothing more nor less. Suppose we aver that Socrates was good, Buddha was good, Jesus was good. Is the meaning we convey on the same plane as that of the number thirteen? No. The goodness in each instance includes a medley of disparate individual acts and expressions. The word "good" sums up their separate idiosyncrasies. In thirteen good boys, thirteen good men, the two "thirteens" are of precisely equal value. Not so with the two "goods," for the boys were perhaps thought of as punctual, the men as brave. Accordingly, if all we knew of Marcus Aurelius and Nero amounted to this, that one of them was good and the other bad, we should be as likely to condemn Marcus Aurelius as to praise Nero. Hence the trouble in re-developing dates and figures.

The same reasoning applies to concrete compound relationships. For instance, do afferent nerves enter at the posterior portion of the spinal column, and do efferent nerves issue from the anterior portion, or *vice* *versa?* Is the grey or the white nervous matter medullated? The mnemonic "A pea" (*a*fferent, *p*osterior, *e*fferent, *a*nterior), might set the first question at rest by making the relationship intimate, "Earl *Grey is non* suited," the second. Without such artificial assistance, many persons would never re-develop disconnected couples. In a mnemonic we impose intension on that which otherwise possesses little or none. The adjective "grey" offers no attachment; nor the words "afferent" and "posterior," nor 1215, the date when the Magna Charta was signed. In the last instance we can, by method, create natural mnemonics. We argue that the sum is one the difference between the two couples of which (12 15) will equally divide the separate couples. While we are constructing our legend we are busying ourselves about how to re-develop, and this is time well spent, for we keep the stream of attention playing about our problem. In this way, especially for short periods, figures are readily retained.

Proper names are likewise hard to re-develop, though they do not present as many obstacles as the other classes which have been mentioned. They have no content, it is true, for three very different persons may boast of the same name; they are, however, more varied and restricted. Perhaps they offer an additional stumbling block—or is it an advantage?—in that they are not so frequently employed as some other classes of words. [*What is your position as regards the problem of this section?*]

Lastly, it is generally recognised that words, when ranged in sentences, are difficult to re-develop. Here also the words are employed in so many different sentences, that it is not easy to connect them with any particular one. Accordingly, of the innumerable sentences used in conversation, few, if any, are literally re-developed, and hence results the difficulty of learning verbal definitions, and the welcome we extend to verse. [*Test this section experimentally.*]

Note, however, that what has been stated above is modified by the action of permanent interests. Thus a cricketer easily re-develops figures relating to runs and wickets; and thus the actor readily learns his part. In these cases the figures and sentences receive a special meaning from the special circumstances, and, therefore, cease to be abstract and contentless.

135.—THE PHYSICAL ASPECT OF MEMORY.*

Except for frequent reference to the part which attention energy plays as regards the memory, no allusion has been made to any physical correlative of secondary development. The reader must nevertheless feel that what we find outside physiology offers no systematic view of the facts under investigation. As well might we argue that the smoke issuing from the funnel of a locomotive drives the train, or that the outer view is a correct copy of the inner structure of the engine; as well might we ignore the silent ocean of air at the bottom of which we live and take note only of puffs and gusts of wind, as to compare what is immediately given with what is revealed by physiology. No; not only are sensations and images, *i.e.*, unexhausted systems, relatively sparse, disconnected and semi intelligible; but we have seen reason to believe that many of them are differentiated by circumstance alone. [*Test.*] The more closely we eye our material the more impossible it becomes to assume two exactly parallel series—a non-neural and a neural one. If the one is a precise reflex of the other, then chaos rules in both realms, and we are compelled to postulate, as in the reported lives of some saints, a miracle at every step.

After a minute survey of the facts, we conclude that what is immediately given at any time constitutes only a partial and imperfect complement of the physical data of memory. We decide that only an intelligent appreciation of the nervous process yields useful scientific notions on the subject, but as neurology is yet little advanced, we cannot turn round and examine the subject in its physiological aspects. We must be content on the one hand with acknowledging the impossibility of bringing a consistent order into non-bodily, unexhausted systems, and, on the other, with weighing the results by analogy. This is no outrage on the scientific method for we have solid grounds for believing that the brain, as a part of the human structure, acts in accordance with the uniformities governing the general bodily mechanism.

Let us examine these indirect evidences so far as they relate to memory. We vigorously exercise the muscles of the arms, legs, chest or other contractile tissues of the body, and after a time we observe that they have visibly grown and hardened, and are more supple and quicker in response. Whatever we may question, it cannot be doubted that a change in the muscles is evident to sight and pressure. To this should be added the fact that what at first could not be compassed by physical force, is readily accomplished after training. These every day happenings are beyond the pale of uncertainty. Now appropriate exercise, translated into our phraseology, means the effective employment of the attention. When then a certain amount of force is expended for a stated period, broken by intervals, we obtain as a result larger, harder, stronger and more efficient muscles. In other words, appropriate physical exercise produces desirable and definite physiological changes. In ch. 3 we enlarged on the meaning of appropriate exercise. What we have asserted in this chapter and in this connection of attention energy, rigorously holds of bodily energy in general. Consequently, to obtain the desideratum of strong muscles, we must not put forth *less* than a certain quantity of energy; nor must we employ *more*, since the system breaks down under great strain; we must indulge in appropriate exercise frequently, because our energy cannot be spent all at once; and the exercise, to be fully effective, must be spread over a considerable length of time. 'Much repetition without effort is waste, coupled with great effort it tires, and defeats its own object. Strength and agility once acquired, especially in youth, are apt to persist through many years, even if they be not much evoked. Occasional employment of the various muscles is imperative if they are not to deteriorate. The weaker the appropriate stimulation, the sooner do the effects disappear.*

Again, we are aware of the feelings which accompany muscular activity. They are few, obscure, simple, and vary within a very narrow range. We also know fairly well what happens when the muscles are in action: a multitude of them contract and expand, and chemical processes are set going. A nerve-plexus affects the muscles directly in the first instance, and the former in its turn is influenced by several centres. The multitudinous movements are connected with the movements of bones, cartilages and tendons, while the vascular systems sympathise. In this way the physiological changes which proceed when I place a weight on the palm of my outstretched hand, are far-reaching compared with what is immediately apprehended as sight and feeling.

Is it a far cry to apply to the brain that which holds good of the muscles, and, by analogy, applies to the heart, the lungs, the stomach, the intestines, the kidneys, the liver and other parts? Energy spent in a definite way has ascertainable results in every part of the body, from the eyes downwards. Shall we insist that the brain is to be isolated like a leper, that with it alone no permanent and predicable modifications follow from activity, though in both instances the effects are precisely similar and are produced in exactly the same manner? Shall we, again, assert that though the feelings accompanying muscular action do not represent even a small percentage of the physical changes involved, it is otherwise with the relation of memory to the brain? Is there no similar source in both cases for the comparatively sparse, disconnected and unintelligible feelings? We may conclude unhesitatingly that appropriate neural exercise creates more or less permanent changes in the way we have just described, and that these modifications again tend to lapse. Accompanying them are indefinite feelings which only hint at the extensive revolution which is proceeding behind the vizor of immediate life. What happens when the modified centres are re-stimulated is scarcely suspected, the process being represented very partially by certain vague combination feelings or thought feelings, as when we believe, or doubt or rejoice. These feelings no more typify or explain what is going on than the muscular feelings are a copy or an explanation of the muscular process.

The leading work on the subject of Memory by the quantitative school, which is now fast becoming the qualitative school, is still Ebbinghaus, *Ueber das Gedächtniss*, 1885. He experimented with nonsense syllables of three letters (consonant + vowel + consonant), employing about 3600 combinations, with a view to ascertaining the number of repetitions required for re-collection under various conditions. In a similar manner he attempted to determine the facilitation which accompanies the attempt to re-learn anything, and the relative reduction of time in memorising a set of known syllables in various orders. Though an extremely painstaking book, *Ueber das Gedächtniss* comes short of establishing any general facts. Several writers have followed in Ebbinghaus' steps.

* The statements in this paragraph may be perhaps best explained by assuming that muscular activity has its place as a part of brain functioning.

Wolfe (*Ueber das Tongedachtniss*, 1886) aims at further simplification by restricting the experiments to sounds pure and simple. The following contributions have appeared in the Psychological Review. Münsterberg and Bigham (*Memory*, 1894) test the relative value of visual, audile and mixed series. Their conclusions are as follows: "When the two senses act together in recollection, they hinder each other" (p. 36); "when isolated, the visual memory surpasses by far the aural" (p. 37); "the memory is impeded by a closer combination of different contents" (p. 37); and, in a continuation of the above study by Bigham alone, "the memory which acts quickly acts better" (p. 458); "the quicker the memory is discharged the better is the result, even when the subjective feeling of certainty is the opposite" (p. 460). In *An Experimental Study of Memory*, 1894, Kirkpatrick concludes that a thing is re-collected about seven times better when the object is presented than when it is only referred to verbally. Baldwin and Shaw write on *The Memory for Square Size*, 1895, and Warren and Shaw have *Further Experiments on Memory for Square-Size* 1895, in continuation of the preceding. Smith (*The Place of Repetition in Memory*, 1896) claims that "the results . . . . confirm in general the accepted fact of the efficacy of continued repetition in impressing any kind of subject matter on the memory" (p. 27). Whitehead (*A Study of Visual and Aural Memory Processes*, 1896) urges, among other things, that "matter memorised aurally appears to be retained slightly better than that memorised visually" (p. 268). Bolton (*The Accuracy of Recollection and Observation*, 1896) examines a large number of class room replies to questions relating to the nature of the weather a week ago, the date of Dickens' death, and the like, together with the degree of certainty attached to the answers given. A similar study to the last is that of Franz and Houston, *The Accuracy of Observation and Recollection in School Children*, 1896 Stetson (*Some Memory Tests of Whites and Blacks*, 1897) deals with white and black school children. To this list may be added Hawkins (*Experiments on Memory Types*, 1897); and Herrick (*The Propagation of Memories*, 1897) who deals with the cerebral aspects of memory. See also the following articles in the American Journal of Psychology. Bolton, *The Growth of Memory in School Children*, 1892; Bergström *Experiments upon Physiological Memory by Means of the Interference of Associations*, 1893; Talbot, *An Attempt to Train the Visual Memory*, 1897; Smith, *On Muscular Memory*, 1896; and Burnham, *Memory, Historically and Experimentally Considered*, 1888-9, which contains a bibliography of the subject. Finally, Ross, *On Memory*, 1891.[*]

136.—How to Re-develop.

(1) *The Problems of Memory.*—What problem as regards memory would a pure spirit be compelled to face?[†] We dare not guess. For aught we know he might always be able to re-develop faithfully and accurately whatsoever he had at any time observed, or he might not in any degree possess the capacity of re-developing a system, or he might re-produce only some things, or only certain objects, under certain conditions; or only dimly and inaccurately. We have no data to warrant

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[*] Herbart preserves his ideas: "All those ideas which, as we are accustomed to say, are preserved by the memory, . . . are incessantly striving upward" (*Lehrbuch*, 1816, p. 20). So Bouillier, *Nouvelles Etudes*, 1887, pp. 191 ff., and *Ce que Deviennent les Idées*, 1887; and Hamilton, *Metaphysics*, 1877, lecture 30. See also Vaschide, *Localisation des Souvenirs*, 1896; and Richet, *Les Origines et les Modalités de la Mémoire*, 1886.

[†] Locke, referring to the memory, speaks of "superior created intellectual beings, which in this faculty may so far excel man, that they may have constantly in view the whole scene of all their former actions, wherein no one of the thoughts they had ever had may slip out of their sight. The Omniscience of God, who knows all things, past, present, and to come, and to whom the thoughts of men's hearts always lie open, may satisfy us of the possibility of this" (*Human Understanding*, bk. 2, ch. 10, sec. 9).

one conclusion rather than another. Once we leave below us "the solid ground of nature," any and every assertion is as if shouted into a vacuum.

Psychology has fortunately nothing to do with pure spirits, as commonly understood. Our business in this place is to understand the neural mechanism, and that offers here several aspects of interest. In ch. 2 we saw that attention is defined and limited, and that, therefore, the greatness as well as the smallness of our efforts is determined. Then we learnt in ch. 3 two truths relevant to the present inquiry: first, the brain reacts according to the line along which it has developed[1]; secondly, during the early years of life the nervous system and the body generally have the greatest plasticity and those years decide how we shall react throughout maturity. Then, in the present chapter, we noted that the facts of the secondary order agree with the conclusions arrived at in chs. 2 and 3.

In improving the memory we must, therefore, take into consideration at least three facts: the limitations of the attention, the uselessness of random exercise, and the supreme importance of starting the education of the memory in earliest childhood. Ignoring any of these will assuredly bring disappointment in its train.

(2) *Direct Observation.*—The first condition of an effective memory is thoroughgoing, detailed, repeated and varied observation. In observing we must not allow the fancy to be our guide, or else we are likely to *imagine* our facts. We must deliberately and in a determined succession scrutinise the various features of a system as well as study our data exhaustively if we are to re-develop much; we must, wherever possible, observe the objects themselves,—and not heed descriptions,—if they are to appeal to us; and we must keep a careful record of our observations. Only when these conditions are fulfilled, shall we possess a tolerable foundation for an intelligent memory. [*The above conditions, and those which follow, should be fulfilled by the student of psychology in all his researches.*]

(3) *Standpoint.*—In all serious thought we ought to be clearly aware of what thing or aspect we wish to re-develop. We must acquire the habit of carefully defining our demand, and must not shift our ground arbitrarily. Certain rules which hold good of the art of observation may for this purpose be employed by the memoriser. In re developing matters economical, anthropological, historical, ethical, psychological, educational, etc., a day-to-day rule is of great advantage. If, accordingly, we wish to know or to re-develop the life lived by some savage tribe, we follow the perambulations of an average person of that tribe from the moment he rises one morning to the moment he rises on the following day. We are thus enabled accurately to record and then to re-produce his normal habits, while otherwise we are likely to connect and re-member only a few striking or accidental details. (Corrections for seasons, special occasions, ages and social strata, will, of course, not be neglected.) Such a rule, applied to the memory, prevents random re-development, which is almost invariably tedious, imperfect, misleading and prejudiced. A second rule

refers to vegetation in general. A plant may be studied or thought of, —to begin with and apart from established science,—from roots upward, and from the time it is a seed to the time it decays. A third rule embraces animal life, though here permanent standpoints are to be chosen for classes rather than for the whole animal kingdom. Perhaps, for non-specialists, "from head-to-foot and birth to death" would satisfy every-day curiosity as regards the higher animals, and many of the lower. A fourth rule deals with systems which have a commencement and are not embraced in the previous groups. Thus a book is studied from beginning to end; a road, a concert, the history of a reign, era, country or person, should be treated similarly. The fifth and last rule includes those classes of systems which cannot be brought under any of the above headings. In such cases arbitrary standpoints are chosen. Instead of observing a ball or a circle at random, I fix upon some arbitrary point as the place from which to proceed and to which to return.

These five rules of observation will be found of unmistakable value to those who are yet untrained. Occasions to apply them are so frequent that once we practise the rules, they soon form a fixed household article in our mental flats. They make re-development easy and certain; they prevent and expose prejudiced re-development; and they allow the full bearing of any issue to be judiciously weighed. It is because of the absence of methodical guidance that so many untenable theories block the path of progress.

(4) *Simplest Case.*—Given that we are *objective* in method and duly possess a *standpoint* from which to set out, we must yet see that we begin by observing or re-developing the simplest possible case. We must, according to this rule, avoid plunging *in medias res.* If I wish, for instance, as a young beginner, to re-develop the method by which vulgar fractions are added, I need not speculate long, nor write down, as it occurs to me, an arbitrary sum, such as $\frac{7}{8}+\frac{29}{53}+\frac{3}{17}$. I choose instead the simplest possible example: $\frac{1}{2}+\frac{1}{2}$. This is a primitive illustration; but the more important or complex the problem, the more imperative is it for us to start with the simplest possible case. In this way a solution will often be reached. In unmethodical re-development, the number of possible cases is incalculable. In intelligent re-development, however, the simplest possible case readily suggests itself to the practised intellect; and one single instance of this kind covers a whole class of facts.

Let us combine these three methods. A boy at school is asked to enumerate the articles of clothing which are worn. Ordinarily he spurts out in fits and starts the name of some article or another. Of many articles he does not think; several he mentions more than once; now he refers to his uncle's hat, and again to his own stockings. If the child, however, be drilled in the above rules, then instead of casting about he would (2) directly or in imagination observe (4) one particular individual, perhaps his teacher; and (3) examine him from head to foot. Memory would thus be easy and accurate. If he desired to be more liberal in his judgment, he could successively think of the various children in the room, then of the teachers, then of the parents, and then of the persons in the street. In practice it will be found that methodical observation is often preferable to re-development. The body of the chapter has shown us that to the eye, in proportion as it is intelligent, the new is contained in the old, the complex in the simple, and for this reason there is no necessity for storing up an infinity of detail when the *rationale* of these details is accessible. *A training which supplies the student with general methods and general facts, is, therefore, the best aid to memory.*

(5) *Generalisation.*—The simplest case, in connection with systematic and graduated generalisation will normally prevent superfluous memorising. Suppose that a man has little to do with vulgar fractions, and that he is apt to forget how to deal with them. He has an easy remedy. A little common sense, in combination with the notion of simplicity, will help him to learn, re-learn or re-develop readily. He knows beforehand that two halves make a whole, that a half taken from three quarters leaves a quarter, that half of a half is a quarter, and that one quarter divided by one half produces a half. Inspection will thus yield or return the secret of manipulation. To make certain of his guesses he only requires to employ a few samples. One well understood complex problem in algebra may thus assist us in keeping bright our elementary mathematics, and a few pages of a book, our French. In this manner a long line of facts which are likely to be forgotten are readily learnt and re-learnt. Let but the simplest case be re-collected or found, and organised reaction soon throws a flood of light on a problem; *but the reaction must be organised.*

A ready understanding consequently dispenses with much learning, its place being taken by cautiously directed observation, generalisation and pertinent re-development. A school boy, for instance, is told how to multiply a sum of two figures by eleven in some special manner. Instantly he will try, if he follows our suggestion, whether he cannot in this way handle more than two figures, and whether multiples of eleven do not obey the same principle. From this point, if he is enterprising, he proceeds to find rules for numbers other than eleven, and thence to related subjects. His graduated method of generalisation deals with varieties, species and higher orders of facts, and he generally dispenses with deduction. Under these conditions the memory is little harassed, while it is yet effective.

Once the notion of generalising becomes a trend, it will be applied everywhere. Every useful suggestion, hint or successful move, will be extended to the very utmost limits, so that no chance is lost of fully exploiting a situation. In this way most difficulties may be resolved and most truths follow as easy deductions. It is to be understood that the generalising must be systematic and graduated.

(6) *Further Rules.*—In the pursuit of discovery some further rules should be applied. When, for instance, a proposition is before us, there should be not only an attempt to prove it; but also an endeavour to show that the opposite contention is justifiable (*opposite case*); that the proposi-

tion does not hold good at all (*negative case*); that it is true to a certain extent only (*rule of degree*); and lastly, that it is applicable to other classes as well (*rule of variety*). (Sec. 7.)

(7) *General Forgetfulness.*—Many persons have a very indifferent memory for isolated facts; they forget what they have to do. In the case of complicated relationships there are probably but two methods to be pursued. One is to make the relationship adequately concrete. For example, when we know how the two ducal houses (sec. 134) came to their respective colours; by what virtue an acid turns a blue litmus paper red; what are the exact processes which distinguish the exit and entrance of nerve bundles in the spinal cord, and what are the attributes which divide white from grey nerve material, etc., etc., —the difficulties of the memory vanish. The other method is an artificial one, and depends on the attachment of what is abstract to what is concrete. Mnemonic systems, however, promise much and perform little. As far as I know them, and I have examined large numbers, they savour, as a rule, strongly of quackery. With an air of great learning mnemonic system builders mask only the crudest generalisations.

General forgetfulness can be checkmated by method. Have a convenient and permanently assigned place for every fact or thing; whatever you have to do, carry it out on the very first opportunity; engagements, etc., should be entered in a diary; objects which are to be removed must have a prominent and permanent place allotted to them; etc., etc. [*In this connection the rule as regards the will* (sec. 157) *should be studied.*]

The Cultivation of the Memory. Good memories are as rare as they are valuable. What is, therefore, surprising, is not that a great many books have been written on this subject; but that so little has been accomplished. Those who are well informed (Bain, *Education as a Science*, 1879, p. 121, and James, *Psychology*, 1890, i, p. 663-7) deny that the memory is capable of *direct* improvement, while others evidently proceed on the opposite assumption. The former position can only be upheld in the sense that the judgment, the imagination, the feelings, are incapable of *direct* improvement. The memory books have little to offer to the man who will not learn a system. Granville's book already referred to is by far the best of its kind. He proposes that we should read or observe with a view to re-membering, insisting that a man's memory will not benefit much when he reads with the notion of understanding alone. For the latter reason, he is not inclined to hold that a well understood passage will be easily re-developed. He holds that men should find out which is for them the easiest method of (1) absorbing, and (2) re-collecting ideas,—by the ear or by the eye,—and follow that. The audile will thus intently listen, and assume that position in re-development. Owing to individual differences, each man will also build up or select his own mnemonics. Given memory-attention, we are next advised to freshen up continually our knowledge of the immediate and far off past, and duly co-ordinate recent acquirements. This little book, I repeat, stands by itself in useful hints. Franck, in his *L'Art de . . . se Souvenir*, 1888, works out in detail a scheme of memorising, based on daily repetition of digested knowledge the key words of which are entered in a special key-word book. Many works on the subject refer in a bombastic manner to the laws of association; but, generally speaking, without drawing any valuable conclusions from those principles. Most memory books contain systems which are intended to enable us to learn lists of kings, dates, etc. As the average man has no ambition in this direction, and as strings of facts should not be taught at school, the value of these ingenious attempts, except for special purposes, becomes doubtful. They consist, for instance, in giving letter values to figures, and combining these into words or sentences. Pick, in this spirit (*Memory and its Doctors*, 1888) arranges Latin and French grammatical exceptions in an order which allows of a ready transition by sense. Such series are remarkably easy to learn; but I do not know whether they are not as easily forgotten. There is still a great need for a few wise rules. Jingles are frequently of use, and there is no reason why we should not manufacture these as occasion arises. To a limited degree we may indulge in haphazard methods by which to re-develop untractable details. For instance, I was anxious to read a book by Garner on the speech of monkeys. Apart from a mnemonic I should have been in danger of confusing the name with Barnett, Garnett, Warner, and so on. By constructing a sentence, this was avoided. "We *garner* corn; but we do not garner *the speech of monkeys.*" All these devices, however, have little to do with the cultivation of the memory as a whole.*

137.—A Bird's Eye View.

In those beings which are most lowly organised, the main trend of activity consists, as we may say, in shrinking from danger and in absorbing nutriment. As we rise in the evolutionary scale, however, we meet with complicated reflex action and with definite sensations, also perhaps with changes such as are implied in the phrase "*horny* handed son of toil." A higher stage of evolution, again, will express itself when, in a mechanical manner, the advantageous course is persisted in and followed mechanically, as occasion arises; here, where artificial selection supplements natural selection, there is wide scope. Lastly, through complications in the circumstances under which a species lives, a model or mimic world may become a necessity, and, accordingly, spurred by needs, there develop *weakened* and *simplified* discharges of a more and more complex kind. These form the memory proper, as we usually understand it. In the truest sense, therefore, the world of memory is a stage where we play the drama of life in advance, and for our own purposes. This sketch, however, does not presume to supply the precise how and when of the evolution of memory. It does not even commit us to the widely accepted theory that the weaker discharge is merely different in degree from the normal one, for that would contradict the fact that with visuals, say, *only* the visual aspect is generally integrated. From the highest point of view, therefore, there is no abyss between the "outer" world and the "inner", and the same point of view teaches us that the present and the past are only distinguished by position in a series.

Additional References.—Arréat, *Mémoire et Imagination*, 1895; Binet and Henri, *La Mémoire des Mots*, 1894, and *La Mémoire des Phrases*, 1894; Bohm, *Zur Theorie des Gedächtnisses*, 1877; Bradley, *Some Remarks on Memory and Inference*, 1899; Jost, *Die Associationsfestigkeit*, 1897; Kennedy, *On the Experimental Investigation of Memory*, 1898; Lasson, *Das Gedachtniss*, 1894; Lewy, *Experimentelle Untersuchungen über das Gedächtniss*, 1895; Müller and Schumann, *Zur Untersuchung des Gedächtnisses*, 1893; Müller and Pilzecker, *Zur Lehre vom Gedächtniss*, 1900; Netschajeff, *Ueber die Gedächtnissentwickelung bei Schulkindern*, 1900; Schubert Soldern, *Reproduction, Gefühl und Wille*, 1887; Smith, *On Muscular Memory*, 1896; Twardowski, *Inhalt und Gegenstand der Vorstellungen*, 1894; Uphues, *Wahrnehmung und Empfindung*, 1888; and Uphues, *Ueber die Erinnerung*, 1889.

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* On the systems generally, see Middleton, *Memory Systems*, 1881.

CHAPTER VI

SYSTEMS AS DISTURBED[*]

Quakes the neural citadel,
Rush we towards our heaven or hell.

138.—PLEASURE AND PAIN ARE NEITHER SENSATIONS NOR FEELINGS.

The temperature of the room in which I write is very low. In course of time, consequently, my feet begin to grow cold, though the body generally remains warm. Slowly, like the tide on the sea-shore, the cold, as felt, rises: it licks the ankles; it has crept up to the knees. Nevertheless I continue to write; my thoughts follow their way undisturbed; and I turn my attention freely in what primary or secondary direction I choose. The cold does not destroy or break through my line of thought. It leaves me unaffected. I do not shiver and I feel no inconvenience. [*Closely examine similar cases, employing experiment by preference. Extend the examination to temperatures generally.*]

Here we have a high degree of cold, as felt, conjoined with an absence of pain. The truth of this statement is indisputable. I am convinced that the feeling is the one rightly dominated "icy cold," and, at the same time, I am equally certain that the feeling leaves me wholly unconcerned. As I am unmoved by the inkstand and paper before me; as the membering of these gives rise to no uneasiness; and as they indifferently occupy the field of vision when the eye lights on them occasionally: so the icy extremities appeal to me only in a casual way. I might as truthfully assert that I suffer excruciating agony, as that the cold pains me. What is more, I have no justification for calling the feeling painful rather than pleasant.

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[*] The physiological point of view is so suitable to the treatment of the subject of pleasure and pain, that I have not hesitated to adopt it in this chapter. The immediate results of feelings are too indecisive and obscure to repay systematic treatment. If, however, the student is sufficiently imaginative, he may think of the feelings as commensurate with the body, that is to say, given a body as *touched* and that same body as *seen*, he may picture to himself that body as *felt*—a body consisting of feelings, and corresponding closely to the seen and touched body, or, at all events, corresponding to the nervous system. In that case the disturbances—the pleasure and pain—may be imaginatively traced in the realm of feeling. Nevertheless, even then it would be convenient to investigate the problem of pleasure-pain as it is *clearly* given to sight and touch rather than as it is *obscurely* given to the feelings.

Is it, then, immaterial, from the standpoint of pleasure-pain, whether we are icy cold or not? We are bound to answer in the affirmative; for that state of cold is consistent with a condition of indifference as regards pleasure-pain. We cannot reasonably urge that a feeling as such is connected with likes and dislikes, while we occasionally observe it in the absence of any appreciable inclination or disinclination. We must pronounce the feeling to belong to no sect or party; we must seek the explanation of our attitude, when we are pleased or displeased, in something which accompanies the feelings rather than in the feelings themselves; and we are bound to consider the common belief that certain sensations are painful in themselves as based on a confused analysis. We are not entitled to hold that because normally the feeling of cold is noticed in conjunction with other systems and is very prominent, it is, therefore, of such and such a nature or determines this course of action or that. Our examination shows that the inner meaning of what happens has probably been mistaken.

The feeling of cold on a particular occasion, as we have seen, was not connected with pain. We were bound to conclude provisionally from this that felt cold generally is not synonymous with suffering. If that, however, be so, we must go farther. Heat, by the same tentative reasoning, cannot be regarded as pleasurable or painful in itself, nor can developments of any kind be considered as possessing pleasure-pain value by themselves. Must we, then, assert that pleasure and pain, whatever else they may be, are neither sensations nor feelings? There seems no alternative. Shall we confess that the prick of a pin or a well-aimed blow do not induce feelings which are necessarily painful, *i.e.*, that the feelings induced are not the pain? There is no escape from such a position. The sequel will offer what I deem ample corroboration of the above contention.

Let us approach the problem from another standpoint. A certain sweetmeat is placed on the table. I, yet a child, enjoy it immensely, and so do my young companions. We say that the dish is delicious. We are frequently regaled with it. Time passes; but the sweetmeat is still constantly placed before us, until we are all heartily tired of it. We loathe the sight of it and hate the thought of it. The sweet morsel has not suffered a change; it is we that have. The flavour which we thought delectable is still there as it always was. [*Is it?*] What once we loved, we hate now.

Here we arrive at our former conclusion by a second road. Not only may a feeling which is regarded as pleasurable or painful become indifferent; it may even change into its opposite. We cannot, therefore, legitimately state that systems are painful or pain-causing, if by pain is meant a feeling. It is possible that in the imperfect state of our modes of expression we cannot help, on varying occasions, calling one and the same system pleasurable, painful and indifferent; but this inability only hides without affecting the underlying unity.

It may be urged: "We grant that the dish retains its chief characteristics. [*Does it?*] Yet it is not the same thing, *e.g.*, the pastry sticks to the roof of the mouth. In short, a series of new systems are the source of our dislike, and it is these which are distasteful." No doubt some physiological change has taken place, and new sensations have supervened in part; but these very systems are to be explained by the same principles. They, too, as we shall learn, can be thought of as pleasant, painful or indifferent. For this reason, however we shuffle the series of immediately given systems, we find that they do not express pleasure-pain. [*Experiment with tastes, smells, sounds, sights, pressures, etc. Drink or eat what is harmless but not to your taste, say, cod liver oil or olives, and see whether and how you come to like it or to dislike it.*]

I take now a normal occasion when I feel cold. That condition is clearly objectionable. What are the features, then, which mark this case, as distinguished from the one we first analysed? They are generally as follows. I cannot keep closely to my writing. The thoughts degenerate and grow thinner. I recur repeatedly to the feelings of cold. I am *uneasy*. Perhaps I shiver, breathe hard, and am *restless*, if the low temperature affects me very much; perhaps catarrh is induced; perhaps the muscles tend to become stiff and the skin insensible. The telling factor in this case is a *central nervous disturbance*. When that is present, pleasure or pain is noticed. But for that disturbance, there would be no uneasiness, and in the absence of such uneasiness the other symptoms we have enumerated would be indifferent. It is, then, because the cold was, in my first illustration, only local and left the centres unaffected that I was free from trouble. Had, on the contrary, the centres been chilled, its effect would normally have been a neural disturbance, accompanied by a temporary disorganisation of thought and motion. In proportion as such a dynamic result is achieved, we are pained or pleased, and we interpret accordingly the feelings whatever their quality. The cold, as felt, and the disturbance are separate effects of the objective cold on our organism. We shall verify this later on. [*Experiment carefully along the line here followed. A whole class room may go through appropriate exercises, each student writing an exhaustive account of what he undergoes. Test, confirm or refute, if possible, the reasoning in the text.*]

Psychologists frequently distinguish between a sensation and its feeling tone. According to this view, every sensation is *accompanied* by a feeling of pleasure or pain; but such an opinion, as we shall see, is untenable. The distinction is also sometimes made between localised pain sensations and comfort or discomfort. Thus it would be said that a sensation of cold can give rise to discomfort; but that it is not a pain sensation. The discomfort here produced is the disagreeable feeling tone which is said to accompany every sensation. Roughly speaking, this distinction between directly and indirectly produced pain is a useful one. Sharply running a needle into the flesh [*do this also very slowly and observe result*], we feel pained directly; being very cold, we feel pained indirectly. On examination, nevertheless, we shall be compelled to admit that pain sensations cannot be readily classed together or differentiated from other sensations, and that all pain is more or less indirect.

I have spoken as if the difference between a feeling and a sensation were merely one of degree. (Sec. 20.) This, however, is not generally admitted. According to Ward, Sully, and many other psychologists, a sensation is something which the individual *attends to*, something which is cognitive in character. A feeling, again, only exists in being *felt*; it represents a state of the subject; it is only known through its effects; and is of necessity unanalysable because subjective in character. Fortunately, the manner in which the contention is urged, makes its refutation easy, since feeling is considered as strictly one with pleasure-pain. Pleasure-pain being, as I shall show, readily analysable into certain sequences, the threatening sand bank on which the non-subjective theory is to founder, proves but a mirage. Yet even setting our solution aside, it is difficult to find a justification for the subjective theory. Apart from indirect interpretations and particular ways of looking at things, psychology only reveals to us systems in various combinations. When we say "*We* are aware," "*We* feel," "*We* act," we mean by the phrases certain complexes and not some mysterious being. Psychologically considered, all thinghood, all objectification, is a formulation of facts from the point of view of practical necessities, and terms such as desire, house, family, ego, nation, book, agree in this that they express, theoretically speaking, complexes whose meaning changes as do the wave forms in an agitated sea. Indeed, as Mach (*Beiträge zur Analyse der Empfindungen*, 1886, p. 18) well says: 'If we ask *who* feels, we refer an analysed complex of elements to a yet unanalysed one', that is to say, to explain the ego, we assume another ego, and to explain that still another. For these reasons I intend to ignore the existence of egos when fundamental questions are concerned, and hence the facts implied in awareness, action or feeling, must be explained on a non-subjective basis. To do otherwise, is to make psychology a matter of terms and not a matter of sense, is to clothe the psychology of rumour and prejudice in a professorial garb.*

Sully, in the second volume of his *Human Mind*, insists at full length on the distinction between feeling and presentation. Whether I view this distinction positively or negatively, I obtain the same result. To begin with, men speak of the feeling of doubt, the feeling of admiration, that of interest, of delight, of grief, of a burn and that of touch. If the definition of feeling, which is here proposed, and which agrees with the popular usage of the word, is accepted, we have uniformly in each of the above instances sensations of the simplest character to which we attach the name of feelings, and the absence of these elementary sensations argues the absence of feelings. In our case the word feeling is a useful word, and one that is appropriate. Let Prof. Sully's definition of feeling, however, be rigorously adhered to, and what is the consequence? "Feelings," as he defines them, are, "the *subjective* side of our experience." That subjective side excludes what we style primary and secondary systems and any changes within these, and refers to some undefinable essence. Hence that side, strictly speaking, must be empty and meaningless to us, incapable of being defined and therefore, any statement as to the intensity, duration, and probable extensity or volume of feeling, as well as any distinction between pleasure and pain must be gratuitous on Prof. Sully's theory. The only objection to this criticism is the supposed immediate fact of the feelings themselves; but here the answer is that the above interpretation of the data does no violence to the fact though it may work havoc among theories which are bound up with the "essences" and "substances" bequeathed to us from the Middle Ages. For these reasons Sully's distinction between feeling and presentation seems to me invalid.

I will here collect the opinions of psychologists on the chief problem discussed in this chapter. Allen, *Physiological Æsthetics*, 1877. "Every act, so long as it is pleasurable, is in so far a healthy and useful one, and conversely, so long as it is painful, a morbid and destructive one" (p. 26). Again, "Pain is the subjective concomitant of destructive action or insufficient nutrition in any sentient tissue. Pleasure is the subjective concomitant of the normal amount of function in any such tissue" (p. 29). Bain, *The Emotions and the Will*, 1875. "Feeling comprises all our pleasures and pains, together with states that are indifferent as regards pleasure and pain and are characterised simply as excitement" † (p. 1). "The most palpable distinction among our feelings is the contrast of pleasure and pain" (p. 10). "In every volition, rightly so named, the stimulus, or antecedent, is some feeling" (p. 14). Beaunis, *Les Sensations Internes*, 1889. "If pain exists to make us feel pleasure by contrast, it would have been better if we had remained ignorant of both, it would have been better to possess more indifference than these fluctuations between pleasure and pain and [illegible] in which pain always reserves to itself the larger and better part of life (pp 221 2) "[illegible] and pain are . . . the fundamental and primordial elements, and the germs [illegible]" (p 251) See also on the expression of pleasure and pain, pp 195 201, on the [illegible] of resistance to pain, pp 190 3, on intense pains, 169 74, on special pain [illegible], pp 202 17, on the non utility of pain, pp 221 2; on subjective pain, [illegible] 56 Bouillier, *Du Plaisir et de la Douleur*, 1865 Pleasure and pain "only differ in intensity and duration" (p 124) "Pleasure and pain are necessarily attached to the exercise of activity, [hence] the soul does not for an instant cease to experience pleasure or pain" (p 82) "The one [pain or pleasure] being given, we must [illegible] the other of necessity" (p 152) See also on bodily and mental pleasure and pain, pp [illegible] 134 6, and on the continuous presence of pleasure or pain, pp 82 92 Dumont, *Théorie Scientifique de la Sensibilité*, 1875 "There is pleasure every time that the totality of forces which constitute the self are augmented, provided that this augmentation is not so considerable that it produces a dissociative movement of the system [illegible] there is pain, on the contrary, when that totality is diminished" (p 67) See [illegible] state of indifference, pp 96 101 Féré, *Sensation et Mouvement*, 1887 p 64 "The sensation of pleasure resolves itself into a sensation of power, the sensation of pain into a sensation of powerlessness" Foster, *[illegible]*, part 4, 1899 "When excessive pressure is exerted on the skin, or when the [illegible] of temperature passes certain limits, the sensation which is excited ceases to be recognised as one either of touch or of temperature and takes on a character of its own; we then call it a sensation of pain" (§ 682) "We may conclude then that the skin in common with other tissues possesses common sensibility, and that when this is excited in excess, so as to distinctly affect consciousness, we call it pain" (§ 683) Hamilton, *Lectures on Metaphysics*, 1877 "The class which comprehends the phenomena of pleasure and pain, or, in a single word, the phenomena of feeling" (ii, p 414) "Pleasure is a reflex of the spontaneous and unimpeded exertion of a power, of whose energy we are conscious Pain a reflex of the overstrained or repressed exertion of such a power" (ii, p 440) "All pleasure arises from the free play of our faculties and capacities; all pain from their compulsory repression or compulsory activity" (ii, p 477) Höffding, *Outlines of Psychology*, 1891, p 222. "The first mark, by which we indicate the nature of a feeling, is its pleasurableness or painfulness" Horwicz, *Psychologische Analysen*, 1872 8 "Feeling is the direct expression of the soul's impulse for self preservation, that which harmonises with conditions of welfare being agreeable, and that which contradicts them being disagreeable" (1872, i, p 169) "No sensation without impulse, no sensation without feeling; sensation is feeling" (1872, i, p 355) "According to our view feeling is the mind's most primitive and most elementary form; it is the primary and sole content of consciousness and the impelling force to all mental development" (1875, ii, p 178) Horwicz also maintains that all sensations are 'objective or knowledge giving, as well as subjective or pleasure pain giving' (i, p 345), and that through habit or repetition pleasure pain is transformed into sensation and thought (i, pp 367 8) See also his third volume Jodl, *Lehrbuch*, 1896, p 375 "Pleasure and pain are the most general modal or fundamental qualities of feeling" Ladd, *Psychology*, 1894. "Pleasures and pains are alike in this that they are forms of feeling" (p 164) "Ideal pains and pleasures are not comparable in mere intensity with sensuous pains and pleasures" (p. 199) Speaking of pleasure pain "Psychology cannot find that the facts testify to this side of life as being by any means all powerful" (p 197) See also on feelings distinguished qualitatively, ch 9 Lipps, *Grundtatsachen*, 1883. "All unsatisfied striving is . . . pain So also all satisfied striving is pleasure" (p 439), and "Pleasure is always the result of psychical furtherance, pain a reflex of psychical opposition" (p 696) Mantegazza, *Physiologie du Plaisir*, trs, 1886. Speaking of defining the word pleasure, he remarks that "the definition of an object known to all, the specific reality of which is unchallenged, is a simple scholastic luxury" (p 1) "Pleasure is a sensation" (p 1)

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* The question touched upon here is amply discussed in ch. 8.

† See also "*On Feeling as Indifference*," 1887-9, by Bain, Johnson, Mason and Sully.

"Pleasure is the mode of a sensation, never the sensation itself" (p. 370). Compare these last two statements. *Physiologie de la Douleur*, 1888: "Pain is a change in sensibility which repels him who experiences it" (p. 5). In dwelling on the possible uselessness of pain, he says: "My servant calls me to dinner every day at six o'clock without her finding it necessary to give me a box on the ear or a thrust with a dagger" (pp. 12-3). See also on expression in pain, pp. 207-317. Marshall, *Pain, Pleasure, and Æsthetics*, 1894: "The subject-matter of our discussion is fortunately perfectly clear. All know what we mean when we speak of pleasure and of pain" (p. 6). *This last kind of assumption almost paralyses psychological progress.* "Pleasure-pain modes are *quales* of all mental states: qualities, one of which must, and any of which may, belong to any element of consciousness" (p. 45). "Pleasure-pain . . . is not sensation, and yet is closely bound up with sensation; it is not emotion, but is closely bound up with emotion also" (p. 35). "Pleasure is experienced whenever the physical activity coincident with the psychic state to which the pleasure is attached involves the use of surplus stored force. Pain is experienced whenever the physical action which determines the content is so related to the supply of nutriment to its organ, that the energy involved in its reaction to the stimulus is less in amount than the energy which the stimulus habitually calls forth" (p. 171). Marshall holds that probably direct nerve stimulation is only followed by pain, because of the crude methods which have to be employd (p. 17); and that the frequent fact of pain *following* sensations is an illusion (p. 18). Mezes, *Pleasure-Pain Defined*, 1895, p. 42: "The prominent idea, the idea attended to, in a whole of mutally congruent elements, is called pleasant . . . . Attention plus inhibition is the mark of pain, attention without inhibition that of pleasure." James Mill, *Analysis*, 1869, ii, p. 184: "I have one sensation, and then another, and then another. The first is of such a kind that I care not whether it is long or short; the second is of such a kind, that I would put an end to it instantly if I could; the third is of such a kind, that I like it prolonged . . . . . . I call the first indifferent; the second painful; the third pleasurable." Morgan, *Comparative Psychology*, 1894, pp. 138-9: "It seems proved that the nerve-endings which are stimulated to pain are different from, and probably lie deeper than, those which are concerned in sensations of touch or of temperature; the nerves with which they are connected pursue a somewhat different course in the spinal cord, and end in different centres in the brain." The position which Morgan accepts has been severely criticised by Marshall and others, and must be received with due caution. Nahlowsky, *Das Gefühlsleben*, 1862: "According to our opinion there exists physical as well as mental pain. The former is a sensation (Empfindung), and only the latter represents feeling (Gefühl)" (p. 10). "Feeling and volition do not exist outside of or along with ideas; but result from these latter" (p. 42). If we hold, as we do, that a sensation is based in the past and is a complex reaction, then Nahlowsky's distinction between "sensory tone," implying a bodily disturbance, and "feeling tone," implying a psychic disturbance (p. 17), is far from evident. Nahlowsky's definition of an idea—he is a Herbartian—is equally untenable in my view. With others he also holds that, normally, mental process is only inappreciably disturbed (p. 47). Ribot (*The Psychology of the Emotions*, 1897) expresses himself thus: "The affective life is appetite or its contrary—that is to say, movement or arrest of movement; at its root is an impulse, a tendency, an act in the nascent or complete state, independent of intelligence, which has nothing to do with it and may not even be present" (p. 438). "Let us define 'pleasure' as an internal state which every one knows by experience, and of which consciousness reveals innumerable modes, but which by its generality and its multiplicity of aspect escapes definition" (p. 28). Robertson, *Psychology*, 1896, p. 191: "Take a needle and bring it gently into contact with the skin. Of what are we conscious? We are intellective; we say it is something sharp; we perceive it for what it is. But suppose the needle is run in. Our consciousness assumes the aspect of feeling; we are pained." Spencer, *Psychology*, 1890: "Pains are the correlatives of actions injurious to the organism, while pleasures are the correlatives of actions conducive to its welfare" (i, p. 279). Again, "Physiologically considered, a disagreeable course of action is one in which compound feelings have to issue in compound actions, through complex nervous structures which offer considerable resistance" (p. 579). "While pleasures and pains are partly constituted of those local and conspicuous elements of feeling directly aroused by special stimulation, they are largely, if not mainly, composed of secondary elements of feeling aroused indirectly by diffused stimulation of the nervous system" (i, p. 288). Stanley, *Feeling and Emotion*, 1886, p. 69: "Feeling then, we conclude, is the purely subjective factor in consciousness; and *per se*, both as developed and undeveloped, is merely pleasure and pain." Stout, *Analytic Psychology*, 1896, ii: "The antithesis between pleasure and pain is coincident with the antithesis between free and impeded progress towards an end" (p. 270). "With ultimate attainment, the mental tendency ceases to operate, and the pleasure ceases also" (p. 271). "The gaining of an end is pleasant" (p. 273). "We simply deny that, in the waking state, our mental attitude is ever wholly without pleasant or painful tones" (p. 288). "Pain-sensations form a class by themselves as truly as do sensations of pressure or of smell" (p. 301). A criticism of Marshall will be found in the same volume on pp. 291-9. The arguments advanced by Dr. Stout do not carry easy conviction. Perhaps the statements which follow are as true. Free progress need not be accompanied by pleasure nor impeded by pain; pleasure does not cease with attainment; the gaining of an end need not be pleasant; and experiment is frequently unable to discover pleasant or painful tones. Stricker, *Das Bewusstsein*, 1879, p. 72: "That which appears to me neither indifferent nor unpleasant, can only be pleasant." Sully, *Human Mind*, 1892, ii: "Feeling consists of all varieties of pleasurable and painful consciousness" (p. 3). "A pleasure is any degree of agreeable consciousness which as such contents us, and is voluntarily held to; a pain any degree of disagreeable consciousness which as such discontents us, and is voluntarily repelled" (p. 3). "We appear justified then in saying that feeling proper is nothing but the various shades of the agreeable and the disagreeable, apart and in their comminglings" (pp. 4-5). "Feeling is the *subjective* side of our experience" (p. 12).

139.—The Nature of the Nervous System determines how far we are Drawn towards, or Recoil from, an Object.

For experimental purposes I have turned acrobat. I support myself on my toes, and, to assist my balance, I stretch out my two arms. For a few seconds I stand as firm as a rock; but as the moments pass, I have to make increasing efforts to preserve or regain my position. At last, in spite of vigilance, resolve and effort, my centre of gravity is displaced. Furthermore, after a while the motor series claims only part of my attention, since with it there has developed a sensory series. No unusual feelings were at first traceable; but, as I persist, distinct feelings are evolved one by one. They attack in succession the feet, the ankles and the knees. In the same way a stream of sensibility beats against the arms, and spreads over the shoulders and the chest. All this not only makes itself felt where nothing special has been previously observed; but as time goes on the feelings increase in complexity.

Was it a feeling of pleasure or pain which upset my balance? Did I will to fall? No. At least, disregarding the second question as not appertaining to our present problem, what happened revealed not a streak of either pleasure or pain. My aim was to learn how long I could support myself in the unsteady posture mentioned, while there was no motive inducing me to desist from my task.

(1) The reason for the failure lay in the structure of the organism; for

the nervous system can only maintain its stability under conditions differing from those under which my experiment was conducted. It is able to resist a certain amount of strain without flinching; but disorganisation gradually supervenes until the nervous system breaks down at last. Our desires have nothing to do with this course. Were the nervous system differently constructed, my experiment would have ended otherwise. If I chose to stand on the very tip of my toes, vigilance, resolve, effort, all alike, would lack scope for action. Collapse would be unavoidable and almost instantaneous.

We here face a force which has to be reckoned with. We meet with modifying agencies besides those of desire, and we are compelled to assume that the relative tone of the bodily constitution enters into the problem. When we are tired, it is not because we like being tired, but because of our nervous structure; when we continue working in spite of being tired, it is again by virtue of the functional tendencies or needs of the organism. Sometimes our resolve has no effect whatever; sometimes but a momentary one; and sometimes we persist with great difficulty. Were our organism structurally different, and structure differs with different animals, our resolves might be either arbitrary dictators, or slaves who can call nothing their own. We might conceivably be so wise that we should marvel at the limited range of Aristotle's outlook, or so dull that an oyster would object to our unintellectual company. *What we desire, both as to magnitude or quality, is decided by our functional tendencies and capacities.* Organised reaction takes care of that. It is a sure sign of insanity when a man attempts to act with a cool disregard of his constitution.

The following are some of the facts which explain why no allowance has, as a rule, been made for the limitations which are here insisted upon.

(*a*) Capacity varies with individuals, and from this men have concluded that the ability itself is created by desire.

(*b*) By means of special efforts we can generally re-distribute the available energy more or less. People, therefore, reason that if we only will strongly enough, no enterprise will be too arduous. In the physical world the narrow limits of exceptional effort are fairly evident, and for this reason it verges on the absurd to imagine an average youth, by dint of sheer determination, uprooting oak trees. Not so, however, in the realm of thought: here all is confusion; nothing is too extravagant for belief; and desire is supposed to be omnipotent. If we were only pleased with the right, some men argue, no mean thought would ever suggest itself, no thread of reasoning would ever be broken, no opportunity would ever be neglected. The palpable falsehood of the doctrine is evident to the unprejudiced observer. Human history gives it the lie direct. Yet owing to the absence of a searching inquiry, the naked doctrine, riddled by facts, still maintains itself. Our studies, however, have taught us that extra effort is equally limited in the two realms—the primary and the secondary, and that such extra effort is determined by the nature of the human structure. If the energy of the organism spent itself entirely in disjointed efforts, and if every action were as incapable of being prolonged as is the action of standing on tiptoe, then we should never demand, speak of or think of extra exertion. The capacity for such, as for all, effort is a capacity of the organism.

(*c*) The third and last reason why mistaken notions prevail concerning the command of desires over the body, is one familiar to us from the third chapter. Appropriate exercise strengthens. Hence we are able to gain greater power if we strenuously persist, which is but repeating the maxim we have just laid down, *i.e.*, that appropriate exercise strengthens. This capacity can be developed to some extent (*by learning what assists; by forgetting what does not assist; by finer judgment; and by muscular and nervous development*), and is in itself a given fact. It is this truth which is here referred to. The practical aspect of this tendency to grow has been fully discussed in ch. 3.

(2) We have seen that a series of special feelings spread and developed as the equilibrium became more difficult to maintain. There were other sensations present, such as those of sight and equilibration, but these will be left unnoticed in this place. The specially evolved feelings had an unmistakable source. They arose in connection with more or less abnormal changes in certain portions of the body, and in their turn they determined nothing. They neither shortened nor lengthened the period of doubt. Had they been entirely absent, I should, other things being equal, have given way neither sooner nor later than I did.

What, then, was their significance? In the particular experimental instance they had none; but otherwise the significance lay in what they were signs of. Let us elucidate this by assuming that they and their physical counterpart did not exist. If, under such conditions, I worked too hard at some problem, I should become more and more exhausted, slowly approaching perhaps the fatal borders of insanity. All the while there would be no warning, and my reason would perhaps give way. Again, imagine that I am on the threshold of solving the problem. Not perceiving this, I probably miss the point. Thus, such feelings inform us usually as to how matters stand, and with this information we can do much, without it little. Must we then assume that a non-bodily fact, pure and simple, has a radical effect on our physical actions? To this one may answer: other things being equal, Yes; but this equality does not prevail. The existence of the non-bodily systems indicates the presence of their neural counterpart. It is the latter which completes the physiological equation. Were the feelings absent, as they often are, it would argue that the physical effect of our activity had not appropriately stimulated the brain. That is where the mischief would lie. Let the non-bodily series alone be annihilated, as is often the case when some action continues while we are chiefly engaged in some other direction, and the actual process, we have every reason to believe, unfolds just as if the special non-bodily systems were present (sec. 19). Once more, then, we discover that indirect factors are responsible for the significance of the sensory series. They indicate that the system is working harmoniously, and that important changes yield their secret to the central regulative portions. [*Attempt to distinguish between various feelings, as heat and cold (before a fire on a winter's day), pain and pleasure, etc.*]

These special feelings or sensations have no particular feature which distinguishes them from those of any other class.* The sense of sight, that of equilibration, that of contact, that of hearing, are in the last resort explicable in the same way as the sense systems referred to. In each instance the significance of what happens rests in what it is a sign of, and not in itself. "All is right with the world" as far as there is no disturbance.

The organism abounds with intelligent or complex activities of supreme importance wherein our awareness plays no known part or almost none. The complicated processes of blood-aerating, of digesting, secreting, rejecting and assimilating various substances, or of propelling the blood, pass normally without sensory indications, and were it not for anatomy and physiology, *i.e.*, for indirect research, we should be almost at a loss to know what happens within the body. Many portions of the organism, too, have unstriped muscles, and frequently no nerves. Activity, in a large percentage of the instances mentioned, is unsuspected by us; and many sense systems become only intelligible after anatomists and physiologists have connected them with parts of the body and pointed out their meaning. The brain, being a part of the body, does not volunteer information as to its processes. This we might know deductively; but experiments recorded in previous chapters, especially in ch. 4, confirm the fact. We have learnt that much of our intellectual life is hidden from us, or revealed by vague feelings only. We find once more that the brain acts as does the body as a whole, disclosing few of its secrets, except to the anatomist and physiologist.

We have carried our examination far enough in two directions: we have dealt with the question of extra effort, and with that of feelings connected with such extra effort. Let us now follow a different line.

(3) At first the vigilance and the effort required in balancing myself were almost nil, or, to express the same fact differently, to begin with, the experiment absorbed so little attention that I could attend to it and to other things as well. As I proceeded my bodily energy became absorbed to the point of exhaustion. Considering, however, that I was interested in the attempt, that did not matter: a labourer uses his full strength in this way hundreds of times during a day. We must allow nevertheless for the fact that our lines of activity are marked out, first, by fundamental needs, and secondly, by organised reaction, and that owing to functional tendencies,† we occupy ourselves with normal bodily and intellectual wants, which do

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*Physical pains as well as mental pains are localisable more or less accurately. Abstract from them the localisable aspect, that is to say, the sensations, and there remains a primary or a secondary disturbance.

†"Our several organs constitute not merely so many capacities for particular functional activity, but so many tendencies or dispositions towards such activity" (Sully, *Human Mind*, 1892, ii, p. 17).

not include exhausting feats. By routine, for this reason, we ordinarily shrink from effort, and require, therefore, a strong incentive to persist in difficult courses. The slightest effort of an unaccustomed kind, as has been repeatedly explained, tends to be dismissed organically; thought after thought enters the lists, and gives battle to the notion of effort. When, on account of training, our reactions are obedient to a purpose, then a difficult undertaking becomes easy, or perhaps loses the character of a task, and in this case the action has become organised. Normally a violent course of action, being unusual, tends to be displaced by others; and since our fundamental instinct is that of self-equilibration, our life could not be moulded on purely experimental considerations. After a time, as we shall learn in the next chapter, the deeper wants compel us to obedience. We conclude, then, that the balancing requires increasing exertion; that such effort will only be forthcoming in the presence of a strong need, or when we are thoroughly trained; that the task gradually monopolises the field of attention, and that the other thoughts which are crowding in, tend to remove the notion of it from the foreground.

What is meant by motive and interest? [*Give descriptions of what happens when you are interested.*] They imply that a considerable current of attention is pressing in a certain direction. The stream of attention flows easily because previous activity has removed obstacles; or it does so because the trend of thought has the power to produce such an effect through appeal to some deep instinct or to some acquired passion or inclination. When a notion leaves us unconcerned, it is conclusive that the general distribution of attention has not been affected. Here, other thoughts co-exist with, and eventually crowd out, the notion. In interest there is a quick gathering of the current; for example, what one man cannot accomplish without sensible exertion, another does without being aware of any seeming strain. Special effort, voluntary or routine, represents another aspect of this fact. Here also there is a focusing of energy, only normally more slowly evolved. An urgent need, again, is something which induces an effort where custom and established interest are absent. The warmth of interest, the feelings accompanying effort, indicate this rush in one direction. It is as if at one moment various groups of persons stood around sundry platforms at an open-air demonstration. Suddenly something startling happens at one of the platforms, and everybody hastens to the spot. The number of people present is still the same; only they have ceased to be distributed—they are massed. So in special effort, motived or organised, the attention is collected. If this were impossible, close attention would be out of the question. The capacity for massing and keeping massed is the capacity for keen attention, and were we able to attend freely, the fascination of interest and the influence of a need would be unknown.[*]

It is difficult to trace the precise antecedent of a disturbance. We might say that in both pleasure and pain something violent happens which compels hasty central readjustment. In pain there exists a violent change with a destructive tendency—a poisoning or starving of the blood or what not,—against which a struggle is initiated in the regulative brain centres. In pleasure we have also a violent change, but with a healthful tendency—a purifying or nourishing of the blood or what not,—and here the central reactions serve only the purpose of hemming in the force, and consequently there is no tendency to total inhibition. From this it follows that in normal action pleasure and pain may be out of the question, and that their place is there taken by inherited or acquired needs. Seeming exceptions, such as tickling, will be found to present special features. Thus in tickling there is a kind of convulsive reaction with few destructive effects, and when this is produced playfully, there is a tendency to maintain the condition. [*Make a careful study of tickling.*] Again, sometimes the fog makes one's eyes smart, and then we observe that there is no apparent tendency to shrink; indeed, movement of the eyelids makes matters worse, for in such a case the smarting interferes persistently with continuous thought or action, and thus induces indirect shrinking, the pain being an indirect result.

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[*] Stumpf (*Tonpsychologie*, 1883, i, p. 68) identifies interest with attention; and Stout (*Analytic Psychology*, 1896, i, p. 225) holds a similar view, stating that "interest, as actually felt at any moment, is nothing but attention itself, considered in its hedonic aspect." Fundamentally, the words Need and Interest are convertible terms.

It will be found that what is said in this section is specially worth the attention of the teacher of youth. One child will readily take to music, cheerfully spending several hours a day in practice, while another will, under similar circumstances, scarcely make an attempt. The difference between the two children will generally be one of aptitude. The first child craves for music and is fascinated by it, because he is so constituted; the second is indifferent to music and is unaffected by it, for a similar reason. In neither case has pleasure-pain or ethics much to do with the course chosen. Similarly, a boy's progress will seem hopeless because he appears attracted by everything except his work, while his neighbour is remarkably attentive. Here, too, the difference is often entirely a question of capacity. Thus a child will be sometimes indifferent, or the contrary, to education, to good manners, or to moral or other influences, and in none of the instances need pleasure-pain be a decisive factor. What is true of children is, of course, true generally. Wherever natural or acquired aptitudes exist,—and every man and woman bristles with them,—there action is readily initiated and continued, not because it is pleasurable, but because there is a tendency in that direction. Consider the case of a child who does not care for school. With him the notion of schooling awakens no response; the word appeals to no need. When, consequently, he has a book before him, his thoughts wander because he is incapable of grasping what is before him. He is thus organically uninterested in all that appertains to disciplined knowledge. If we take the case of a child eager for schooling, we frequently find essentially the opposite; he is readily and organically absorbed in making intellectual progress. Thus ability and inability, congenital or developed, often determine what we shall do or leave undone. The accompanying pleasure-pain is in such instances without effect on the course of action pursued.

140.—DEFINITION OF PLEASURE-PAIN.

The following is our definition of pleasure and pain: Where there exists a neural disturbance (ending in an attempt to check or detain a group of systems), there we meet with pain—opposed disturbances, and pleasure—semi-opposed disturbances.*

To illustrate. A speck of dust has found a resting place on the surface of my eye. Being in an experimental mood, I determine to act as a bystander, and I do nothing to remove the intruder. I let nature run her course. The eyelids open and shut faster and faster; tears rush abundantly down my cheeks, and my sight becomes dimmed. The motion of the lids is accompanied by special feelings similar to those described in sec. 138. My walk has a tendency to become unsteady, and as I reach home I feel more than once that I am likely to fall at full length forwards or backwards, owing no doubt to the sense of equilibrium being affected. To escape a catastrophe, as I am now thoroughly weakened, I lie down on a couch. My head is attacked and is becoming worse and worse. Observation of what is going on is difficult. It has ceased. I am now engaged in drying my tears, and in an endeavour to rid myself of the speck. The arrest of observation eases the strain.

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* I have added these words in parentheses, so as to exclude pathological cases and others where there is simple giving way or adaptation without any uneasiness.

So long as I was engaged in noting what happened, I could not be said to have been subject to pain or pleasure. As well might the visual system implied in seeing a brick be regarded as appreciably pleasurable or painful. For scientific purposes I would as readily look at, or look away from, a thousand bricks as one, and in like manner I am always ready to observe a variety of miscellaneous objects,—pins, paper, books, etc. It may be granted, for argument's sake, that in cool observation there is present a microscopic quantity of pleasure or pain; but all I wish to urge here is that what I observed did not disturb me. The various sensations did not in the slightest degree ruffle my temper, nor can I honestly assert that they could be classed as either pleasurable or painful. I neither wished them to remain nor wished them to go. I was only watching their development, as an astronomer might follow the evolution of an eclipse.

The whole train of events, until observation became discontinuous, was unrelated to pleasure-pain considerations, and the chain of sensations and feelings indicated only how the speck of dust had irritated various portions of the nervous system. Without wishing or choosing to do anything, I broke down, to the point of having my thoughts scattered. The general loss of muscular and nervous tone and the headache had the same source, and I had to relinquish observation in spite of my wish to see it prolonged.

We gather from this account, in agreement with sec. 139, that feelings exist which, according to circumstances, are described as pleasurable, painful or indifferent. They are perhaps marked in character, and yet have no pleasure-pain aspect. A series of events can thus take place in the absence of any pain or fear of pain, or pleasure or desire for pleasure. The motive or the reason for the particular acts as they one by one arose or followed each other, was not a yearning for happiness or a shrinking from evil to come; it lay rather in the acquired or inherited needs of the organism. The events co-existed with, or succeeded each other, without any desire or dread prevailing.

It is certain that acts where the highest centres remain undisturbed form a part of reality. From that alone one may deduce the probable inaccuracy of the view which asserts that whatever we do is the outcome of either a yearning or a shrinking. This carries us a step farther and entitles us to say that if I had acted as usual, and my desires and dreads had mingled with these events, then *some portion at least* of what happened would not have been the result of likes or dislikes. It cannot be contended that what occurred in the abnormal experiment does not justify the conclusion that similar things take place in the normal state, for that is contradicted by common observation. A part, then, of our activity is not connected with pleasure-pain, but due to organic needs; what about the remaining portion? One must reply that that portion also is governed by organic needs whose aim is to restore the disturbed equilibrium.

Observation was easy at first, and for a considerable period beyond. When it broke down, a fresh series of events was noticeable. Evidently the nervous system was becoming unstable over a larger and larger area. The last fort to be attacked was the neural citadel, and it was then that observation finally ceased. This conclusion is one of great importance. Pleasure and pain certainly appear to be connected with the instability of the inmost nervous centre. When that centre is intact, there is no disturbance, and feelings then determine neither smiles nor frowns. When the centre, however, is disturbed, we are swayed to and fro. Hence attention flows along smoothly and continuously when the nervous centres are stable; while when the stream is violently and capriciously interfered with, we speak of pleasure-pain. In the latter case we are not masters of ourselves, for the nervous centre is in some way disarranged. Pleasure-pain is, therefore, present in proportion as such disturbance exists, and the absence of the disturbance accounts for the absence of the pleasure-pain in the first stage of the occurrence we are examining. *As soon as inhibition of a threatening disturbance becomes a task, however small, so soon pleasure-pain begins.*

The disturbance followed without being desired; then I occupied myself with alleviating measures; and at last I obtained relief. This is instructive, and an important conclusion may be drawn from it. When such an accident happens, the offending speck engenders one class of need-determined effects, while another class of need-determined effects usually succeeds as a reaction, the object of the second class of effects being to nullify the first. Instead of the irritation being stored and finally leading to headache and prostration, a counter-movement is initiated and the irritation is allayed. As only certain centres are specially affected, movement has to be of an apposite kind, since not every effort will bring relief, and hence also the attention is employed in removing the cause of neural discord. These counter-movements claim the attention, and energy can, therefore, only discharge itself readily into that channel. Ordinarily, by these two methods, peace is restored to the nervous system. They are nature's means of securing sanity. Our anxiety, our fears, our screams, are accompaniments or expressions of a normal nervous process the form of which is socially and hereditarily determined. *The presence of an offence gives rise to excitement, and that leads to certain movements which allay or remove the excitement.** The feelings and the thoughts, if we provisionally separate movement from feeling (sec. 174), acquire their significance from the physical violence they symbolise. We do not shrink from this course of action or from that because of certain feelings. The normal shrinking is accounted for by the peculiar structure of the nervous tissue, and the feelings by themselves, therefore, lack rationality. We might as well contend that the rising and the falling of the barometer compels the surrounding atmosphere to contract and expand. Once more we see an apparently anomalous process explained by reference to obvious organic facts. Why otherwise should we shrink from, or gravitate towards, anything whatsoever? On the organic theory what happens explains itself, and no other conception seems to satisfy the known facts. [*Try and ignore neural disturbances*]

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* Most of the writers referred to at the end of sec. 138 deal with the expression of the emotions and, by implication, with the expression of pleasure and pain. See specially Darwin, *Expression of the Emotions in Man and Animals*, 1872, who treats of the larger outlines involved in the subject.

The range within which pleasure-pain acts must be further narrowed. Suppose I have reached the condition where unstrained observation becomes very nearly impossible. I then decide deliberately to restore the state of indifference. With the utmost calm I employ means after means until the results of the speck in my eye are nullified. My attitude is the same as when I am turning over the leaves of a book or when I brush my hat. I am entirely unmoved, and I remain so during the whole of the process. Under the circumstances, the disturbance being inhibited throughout and allayed deliberately, no pain develops. *Only in so far as there is an unregulated striving, can we speak of pleasure and pain. Only so far as the disturbance is left to itself, and is not interfered with, is there pleasure-pain.*

The way in which we regard what is taking place is also important. [*What is your point of view?*] During the first portion of the accident I quietly observed; during the second portion I calmly took measures to maintain my neural equilibrium. It was open to me to regard with terror what had occurred, trembling each time I thought of the accident, taking every possible precaution to prevent its repetition, and dwelling on the matter again and again. If I had been much excited during the loss and recovery of my balance, sensible revulsion would, at least for a time, have been unavoidable; but that did not follow my cool attitude. I, therefore, dismiss the thought of what has passed, and remain indifferent to a second attack. My memory is not impressed by what has happened, and the incident is quickly forgotten. The view, therefore, which we take of what befalls us has important consequences. We may, through appropriate practice, become hysterically timid, shrinking into nothing at the thought even of a trifling accident, and wasting life's golden opportunities in passionately combating imaginary evils. Or, if we are wise, we perhaps come to ignore pleasures or pains unless they further ideal ends.* Between these two points of view there are many intermediate gradations; but all that we are concerned to know is that pleasure and pain imply muscular and thought disturbances, and that these can be either accentuated or inhibited. It must also be understood that with civilised beings pleasure-pain, like all happenings, is interpreted in the light of a comprehensive scheme, and that the primary reason for the neural break-down lies, of course, in the delicate structure of the nervous system.

If ready inhibition and one's point of view can and do change the pleasure-pain value within large limits, then the problems of optimism and pessimism must be re-examined. If we have been right so far, it becomes absurd to maintain that the very fact of our preferring existence proves that the sum of life's pleasures has been greater than that of life's disappointments; for this would imply that we have somehow kept count of all our pleasure-pains and have now and then struck a balance, whereas we have seen (ch. 5) that the majority of developed systems are dis-integrated, and that the remainder are interpreted in a loose and capricious manner by one's point of view at a particular moment. Indeed, we have learnt that neural disturbances are rare, and that we are influenced generally by our various needs, natural and acquired. A criticism of life, from the pleasure-pain point, irrespective of neural capacities and primary needs, is, therefore, irrelevant. Similarly the question of whether life can be worth living is connected with the fact that one's point of view makes a crucial difference. To one with shaken nerves everything is hateful—the sunshine and the rain, the heat and the cold, familiarity and novelty; but he who is strong-nerved and yet sensitive, finds it difficult not to sympathise with every one of nature's moods. The former attitude is the unnatural one. It results almost entirely from paying attention to the painted face of pleasure. When we have once learnt to be guided by the simple organic needs of our being, the ink bubble of philosophical pessimism bursts. Pleasure and pain must be probed below the coloured surface before we can attribute to them a great life-value. [*Examine attempts at relief through movements in cold, heat, pain, pleasure, etc.*]

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* Hence men trouble little about pains not connected with normal needs, *e.g.*, *dream pains and such pains as are related to delirium, insanity or convulsions.*

In Sully's *Pessimism*, 1891, will be found a bibliography of the subject of pessimism, and an account of the principal pessimist systems. In view of our conclusion that colourless needs and not pains are the motor forces, Schopenhauer's criticism of life loses its value. Hartmann's *Philosophy of the Unconscious* has even feebler psychological foundations. The principal works of these two principal pessimists of modern times are Schopenhauer (d. 1860), *The World as Will and Idea*, trs. 1883-6, and Hartmann, *The Philosophy of the Unconscious*, trs., 1884. As to extreme forms of pain, see Beaunis, *Les Sensations Internes*, 1889, pp. 170-4; and as to a qualified optimism, see Bouillier, *Du Plaisir et de la Douleur*, 1865, pp. 104-19. The latter would reckon on the credit side of life's balance the pleasures of health, of living, of breathing, of moving and of thinking (*ibid*, p. 115).

Beaming eyes, smiles, laughter, tears and buoyancy express and *constitute* pleasure; and where they are lacking, pleasure is also lacking.* Here the attention tends to dwell on or to recur to the act. Eating a luscious pear I retain the sensations as long as I can: I eat it slowly, so that the taste may last the longer. I think of it while I am eating and when I have finished with it. Yet if I had wished I could have observed myself consuming the pear while unaffected by pleasure. Here, too, the attention would

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[*] There is little outward expression in the radiant contemplative joy of the accepted lover or the successful discoverer. In such cases, I apprehend, the rush of thoughts, the dreamy abandonment, the unusual serenity, the complete absorption, indicate the successful attempt to recover one's equilibrium. On the other hand, marked outward expression may be to a large extent forced or suppressed, suggesting a greater or a lesser disturbance than there is actually present.

have been occupied about the sensations rather than with them, while the disturbance would have been ended. [*Test.*]

Pleasure-pain is a process which is only explicable in terms of motion or change. Let us again define it. *Pleasure-pain exists when a neutral disturbance is present; pleasure, in so far as the tendency to return to the normal or undisturbed state is checked; pain, in so far as such a tendency prevails unchecked.* Let us further explain our terms. The type of undisturbed activity is to be found in organised reactions of a simple kind. My pen, for instance, hurrying along the surface of the paper without giving rise to emotions, reflections or convulsions, is an illustration of undisturbed action. So, liveliness, smiles, laughter, shouting, a sparkling eye, eagerness, whether they last for a minute or for hours, are signs of neural disturbance, since their presence has the object of relieving such disturbance.

A neural disturbance is distinguished by an abandonment on the one side, and an attempt, when possible, to counteract the disturbance. This is expressed by direct and indirect endeavours. If we introduce a thorn into the hand, we may proceed to remove it, and when this is done the disturbance is practically checked. If that, however, be impossible, then, under normal circumstances, we fret and become low-spirited. In the former case the object is attained directly, the disturbance being removed; in the latter indirectly, the disturbance being allayed through the fretting. When anything goes wrong, there is an organised aptitude for recovery. Now normal happenings are not disturbing; they are not accompanied by crying or laughing, or by any of the modes which express the presence of an irritant. So also, what was once abnormal may, through constant inhibition, become normal, and lose its pleasure-pain value. A neural disturbance is normally accompanied by special feelings, resembling those which are present when we make a prolonged effort or when a speck of dust irritates the surface of the eye. These, by complication, signify to us the disturbance, and the absence of the disturbance implies the absence of special feelings connected directly with the irritation. In grief, again, the feelings indicate an unsuccessful counter-movement. As long as the occasion for grief remains, we mourn; but let that be removed, and we gradually return to the normal state. In good spirits the tendency to return also exists; only it is for a time resisted. The smile, the buoyancy, the laughter, are all counter-movements; but the rebellion is fed, and does not readily collapse. Nevertheless, pleasure, like pain, tends to give way before the state of indifference.

I trust I have made clear what I mean by a neural disturbance, by pleasure and by pain. We must now consider the meaning of inhibition. [*Practice and observe in yourself cases of inhibition: hold a hot egg in your hand.*] Walking in a wood on a rainy morning, I slip on the clay soil, and fall with great force on the hands and arms outstretched to save me. The feelings which develop are massive and acute. A flame of pain is enveloping me when I suddenly, for experimental purposes, induce general hardening of the muscles. The pain is now gone, though the feeling which accompany it remain behind. The tremors, the muscular depression, the anxiety, the despondency, have been banished by the position I have assumed. Except for the special feelings and the comparative rigidity of the muscles I am in a normal condition. The hurt produced a neural disturbance and counter-disturbance, and the feelings were but one expression of what took place. The physical position I assumed did away with the disturbance, and, therefore, with the pain and the connected feelings. Inhibition, therefore, *so far as it is not a task*, is the intervention of an organic condition which excludes neural disturbances and, by implication, pleasure-pain. Inhibition varies, of course, indefinitely with the occasion, with interest, motive and training, and hence a great effort will sometimes have little or no effect, while an imperceptible effort may be almost omnipotent. Men practise inhibition in so far as they are strong-minded and strong-nerved, and as it is a special case of effort, its application is largely organised.

Binet, *L'Inhibition*, 1890; Binet, *Un Cas d'Inhibition*, 1891; Breese, *On Inhibition*, 1899; Heymans, *Ueber psychische Hemmung*, 1899 and 1902; Sully, *Human Mind*, 1892, ii, pp. 246-8.

Pleasure-pain does not dwell in an irritant, nor in the feelings produced by that irritant, nor in a subjective state; it is constituted by the violent reactions of the neural mechanism. As that reacts, so what happens, regardless of the nature of the feelings at the time, is either pleasurable, painful or indifferent. Hence one man's pleasure is another man's pain, though the feelings be alike quantitatively and qualitatively, and consequently, when the reaction is not according to the definition, a course of action is neither pleasant nor painful. The larger proportion of what happens to us, only serves a purpose. Thus sighing brings relief when I am disturbed by the cold, without affecting the feeling of cold; and, on the other hand, sighing makes no difference when there is no disturbance connected with the chilled extremities. [*Verify.*] A martyr is stretched on the rack, and yet glories. He feels the torture; but his central nervous system, equal to the task, does not give way, and he plays the part of observer instead of sufferer. We can thus readily imagine an individual whom no torture can move, one namely whose system is able to bear the strain. If the martyr were a weakling, he would yield at once, for a man of indifferent nerves cannot resist an attack. Thus we might think of ourselves as competent to stand the greatest strain, or as incompetent to bear any strain at all. It is this fact also that explains faith cures and stigmata, since these depend on the condition of the nervous structure. On the same grounds we conclude that training is desirable because the nervous system is trainable. For the man of science, therefore, heroism, apart from the nervous structure, is a word signifying nothing. Where there is no neural disturbance, there is no pain. As a consequence, pleasure, and the world's power, pomp and praise, may be despised by the strong man. We shall meet with other deductions which follow from our definition. These few must suffice in this section.

I must add a further word in explanation of the connection between needs and pleasure-pain. Ordinarily, when dinner-time comes round, I am ready for my meal, though I can scarcely say that I feel hungry. In such a case my action is determined by a need, though there is no pleasure-pain. Take, however, another instance. Some one treads on a very tender corn of mine. It is with the greatest difficulty that I refrain from crying out, and a shudder passes through my whole body. That the particular reactions of crying out and shuddering ease the pain and are advantageous to the organism, is obvious; and hence it follows that natural selection has wisely favoured organisms which promptly and effectively meet certain violent attacks which disturb the body's equilibrium. In other words, *among the fundamental needs given with the organism is that of protecting it from swift disaster;* while, at the same time, the methods of protection in such cases are also mostly due to heredity. The very uniformity in reaction under pleasure-pain suggests that urgent needs require prompt solutions, and that, therefore, almost everything is left to inherited methods of response. For this very reason, ordinary activity, implying as it does adaptation to varying conditions, is chiefly based on what is acquired, and is free from disturbances. Pleasure-pain, then, argues an exceptional state which has to be met in an exceptional way. As for pleasure, it is evident that exceptionally favourable circumstances should be provided for by exceptional reactions determined congenitally. Both in pleasure and in pain needs determine the course pursued, while the disturbance merely indicates that the organism has received a severe shock.

Naturally enough there are minimal degrees of pleasure-pain. We often feel very slightly pleased or displeased; and not seldom the disturbance is so small that we scarcely know whether to call it pleasurable or painful. In most of these cases the pleasure-pain merely expresses the trend of our needs, while the needs themselves are to all intents and purposes unaffected. That is to say, if a few grains of pleasure-pain were present, the ordinary needs, by producing a certain amount of inhibition, would pursue their course unaltered. What is more, even serious disturbances have frequently little influence. An ignorant or stupid parent is not seldom surprised to find that severe punishment is ineffective, though the child's reprehensible conduct yields him no pleasure worth mentioning. We speak, in such cases, of obstinacy, forgetting that pleasure-pain is throughout an unreliable factor in determining action. The wise parent and the legislator accordingly abandon the primitive methods of punishment, and use all their energies to discover other means of grappling with or forestalling difficulties. Hence the modern theory of punishment as regards children, criminals and lunatics fully bears out my contention that whip and sugar stick are not the normal forces which regulate human life.

To touch on another point. Our attitude tends generally to realise itself, at least to some extent. When for some special reason we think that something distasteful is really not so, we swallow it without feeling any ill effects. On the other hand, if we eat something wholesome, and are then told that it was tainted, we are very likely to have an attack of nausea. Thus we may cough and feel extremely uncomfortable, because of a supposed fish-bone in the throat, which has been in reality removed. So, again, the thought of food makes us feel hungry. These and similar instances illustrate the fact of nervous inhibition and nervous concentration; and are but unusual exemplifications of normal activities. It happens not infrequently that I am a little indisposed. As long as I am unaware of this, my behaviour is almost normal; but let some one remark "How pale you look!" and a sudden collapse follows. The process of acting out our beliefs is well illustrated in childhood. If we only succeed in diverting the young child's attention, it often ceases crying and begins to smile, while with adults, interests usurp the place of their aches and pains. Every case of self-control or of terror has the same origin. Physicians have to some degree exploited the effect of implicit faith. They prescribe drugs, courses of diet, changes in environment, which are indifferent in themselves, in the hope that the *suggestion* of a cure will produce the cure. Indeed, the faith which the physician and the quack inspires is an important factor in medical treatment. It is, however, in hypnotism that a desired point of view is suggested most easily and with the greatest effect, owing to the readiness of the subject to absorb suggestions. In the normla state, attention to any portion of the organism creates therein nothing more than slight changes; but in the abnormal hypnotic state imaginary poultices act almost like real ones, and fancied wounds show signs of becoming actual. "Mental Science" and faith healing, like Spiritualism, exploit the fact just explained (sec. 232). The "Scientist" who insists that diseases and death do not exist, and who sits, or "communicates," with his subject, only makes the best use of a recognised fact, and for this reason alone does he occasionally bring about cures. ***Experiment is readily applied to supplement observation.*** [*Think of various parts of the body and of various things pleasant and unpleasant: think of a nice dish, etc.*] However, the only fact elicited is that our attitude, for good or ill, tends to actualise itself to a minimal degree. How this happens is a matter which belongs to the department of physiology. Faith is consequently for the psychologist a prosaic process, like all other processes; when properly applied, faith may move mountains; but when brought forward as a universal panacea, it is clearly not to be relied on. Good sanitation, plain living, a sociable temperament, a reasonable quantity of reasonable labour, rest and change—such are the great preventatives of illness. The application of "X" rays to surgical cases throws into the shade the virtues of faith healing and "Mental Science." *

On one occasion, as an experiment, I said to a friend that I could tell him in which hand he held a coin. The challenge was accepted, and the two closed hands were placed before me for inspection. I glanced at the two hands, guessed, and was right. This was repeated a number of times with three persons, till they looked at me as if I were in league with spirits. A long time passed, and one day I re-membered the incident. I tried once more with one boy of ten and one of fifteen, and was uniformly successful. They asked me how I did it, and I told them that the hand which held the coin was firmly pressed together, that there were tokens of restlessness in that hand, and that other signs were observable. We then tried again, and I failed almost uniformly because the children ceased to attend to the hand which held the coin.

In experimental psychology it is said that the reaction follows more quickly when we attend to the movement to be made than when we attend to the sign which is to induce the movement. On the above theory this is obvious. When we are ready for a movement, all the parts to be moved are arranged for ready action, *i.e.*, part of the act is already carried out. For instance, a child is approaching me and I prepare to take him by the hand. In this case all that remains to do is to grip the hand. So, almost universally, *we do not wait till the last moment to perform an action; but we carry out as much of it as possible before the compelling moment arrives.* For this reason, also, since the process is organised, we find it difficult not to *attempt* to act, when we intently think of acting. Thus far the ideo-motor theory is justified.

141.—IRRITANTS.

I put my hand gently into a clump of stinging nettles, and I forthwith note the peculiar feelings resulting therefrom. [*Imitate this experiment, and initiate similar ones: tickling, gentle irritation of hair, skin, joints, etc.*] There is no pain. I observe the extent, the variety and the changes in the feelings. The attention is divided: on the one hand there are the observed feelings, and, on the other, my reflections on the situation; but as these do not absorb all my energy, the remaining power is employed in taking notes. Further, if we do not scrutinise the feeling, the energy must be spent otherwise, for semi-activity is out of the question. Suppose, therefore, that the feelings persist and that they obtrude themselves upon me. I am then forced to think about them. Assuming that they offer no scope

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* See Goddard, *The Effects of Mind on Body as evidenced by Faith Cures*, 1899.

In many cases nothing is gained by being nervous, the true principle being to discover the best method of ignoring an irritant, and to act accordingly. Some persons are so hyper-sensitive that their whole life is a nest of misery: they shrink from everything; they are afraid of everything. Given right ideals of what we wish to be, we would aim at building up particular classes of organised reaction whose object would be to promote our highest needs. Through interpreting pleasure and pain in terms of sensations, men have hitherto shrunk from much that ought to have been welcomed, welcomed much that ought to have been shrunk from, and been indifferent to what should have engaged their serious attention. It is certain that in the future the position a man takes up will be guided by objective aims rather than by subjective impressions. It will be found that tastes can be accounted for and moulded.

Why did the gosling repeatedly scratch itself with its feet when it had issued from among the nettles? The reason is that dust particles and small bodies generally are often dislodged by that method. Now the sensory effect of the stinging nettle is a similar one, and, therefore, as explained in sec. 99c, we act similarly. The greater the irritation the stronger is the reaction, and the more it resembles another irritation the more like is our reaction. That is to say, our acts are normally determined organically, and if they have their foundations laid in ignorance and superstition, they fail to be appropriate. In this way a person reasons himself into the belief that a cold morning bath and a long walk are good for him; he actually thinks that he is enjoying these, and yet onlookers recognise that his judgment is at fault. So some person believes that he has reached the summit of blessedness when he is really to be pronounced unhappy, while another thinks that the world weighs heavily upon him when he is normally as happy as a bird in Spring. As the customary influences vary, so does our reaction. In organised processes of the obscurer type, when stimulated by needs, we only act; we do not act because a certain object yields pleasure or prevents pain; we proceed thus, because we have proceeded this way before. Indeed, in instances where the origin of the process is not easily traced, we frequently mistake the (supposed) original motive.* We say that we do this or that because we like it or because we dislike something else, when the contrary is often the true explanation. Stimulated in this wise by a belief that every action of ours is performed because of the felt pleasure it involves, we boldy assign felt pleasures to every act, without sufficient evidence to justify such a course. Urged by our philosophy, we imagine the feelings or manufacture them during the analysis.

We learn here how pernicious is the largely prevailing custom of assuming that pleasure-pain states are obvious. It is most difficult to obtain from any person information with regard to his feelings, for he usually replies in accordance with some shallow theory. Casual self-interpretation is no less fallacious.

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* "It has been cynically observed that people go into society less in order to be happy than to seem so, and one may add that in this semblance of enjoyment they may . . . . deceive themselves as well as others" (Sully, *Illusions of Introspection*, 1881, p. 14).

142.—ORGANISED REACTION LARGELY DECIDES WHAT SHALL BE REGARDED AS PLEASURABLE OR PAINFUL.

I am at the sea-side, and, intending to bathe, I step into the water. I begin to shiver with the cold, and rush out.

The reasons for such conduct may be manifold. The mood of expectancy we are in, influences us to a considerable extent. We may walk into the water unconcernedly, in which case we obtain somewhat of an indifferent reaction. Probably we shrink a little, but scarcely observe the shrinking. Or we plunge into the water fully determined not to be driven back by its possibly low temperature. In this instance, though the water be cold, we receive and bear the shock with equanimity, if we are strong-nerved. We shall, if we are so inclined, meet pleasure and not pain. Those stimuli which are connected with pleasure are not inhibited from propagating their impulse; while those others whose free sway would mean pain, are restrained. These latter become indifferent; they do not excite to action in any direction; and they have their poison fangs made harmless by central inhibition. In the special case we are considering, expectation has perhaps meant that I was unnerved to start with, and that instead of fortifying myself I threw away my shield. Whatever shock, under such circumstances, the cold waves might communicate would have more than the ordinary effect. We shrink before we actually touch the water, and we are excited when there is nothing to be anxious about. At the commencement our nerves are in a state of extreme excitability and readiness to yield, and consequently a swift collapse follows. Expectation varies within wide limits; and except when we are taken by surprise, it always plays a considerable part. Inhibition or control are thus usually strengthened or weakened in the face of a contingency. Were we to apply an appropriate instrument, the nervous adjustments would show a constant relationship.

For the above reason it is often possible not only to react differently; but to react oppositely. Instead of shrinking from, we might revel in, the cold water. The limits to such variations are of two kinds. First, the application of inhibition soon reaches the maximum extent. Accordingly, when the centre of inhibition is powerful, our conduct may change capriciously; but when it is weak, we have little chance of adapting our reactions. The resisting power of the centre thus ultimately decides within what range our reactions are to vary. Were the capacity absolute, pleasure-pain would never affect us, except at our discretion; were we helpless, life would be intolerable and impossible. Secondly, our attitude towards objects is not a question which is solved at the moment when some course of action becomes desirable or imperative. The general manner of reaction is determined organically (ch. 3). We grow into that manner, and for this reason even our behaviour when we are surprised is not outside the organised circle. Some men will, therefore, come to remain perfectly cool under harassing conditions, while others will lose their presence of mind when the least occasion for surprise arises. Not one circumstance, but a hundred, will be arbiters of how we are to react. For this reason the method of reaction of the average man is far from uniform, trifles sometimes suggesting differences in his point of view. We need not, therefore, think that environmental factors alone make us react or act as we do; for since our attitude is subject to custom, it is also liable to deliberate training.

Man's relation to pleasure and pain, as we see, is not a fixed one, for the warmth and quality of a feeling are not always connected with one class of conduct. Strictly speaking, they have nothing to do with pleasure-pain. Only when other things are equal, when all the conditions are repeated, do they acquire that meaning. As it is, great warmth (or intensity) co-exists frequently with indifference; or slight warmth (or intensity) with great dislike or love. [*Test this carefully and repeatedly.*] The reaction of the nervous centres settles this fact. It is thus that when an acute irritant is present,—as when my throat has been inflamed for some time,—a hardly perceptible sensation is connected with very great pain. Consequently, what one man hates, another is indifferent to, and a third is fond of. We conclude, then, that the feelings are at best only one factor in a pleasure-pain problem.

143.—INFERENCE AS A DETERMINING FACTOR IN PLEASURE-PAIN.

My feet and my feet only are icy cold. I complain; I go to the fire to warm them; and I do not rest until the cold has disappeared.

My action results from wrong inference. Usually when I feel chilled anywhere, I also feel chilled centrally. Under those circumstances it is natural to take measures for increasing the temperature of the body. When, however, the lower extremities alone are cold, there is (sec. 138) a resemblance as to feelings, but not as to the urgency of attending to them. These two factors, as is commonly the case, are confused; and we act as if something were pleasurable when there is an unfavourable neural disturbance, and painful when there is neural serenity.

We have seen the part that quantitative and qualitative reactions play. According to the degree of our education we argue that what is true of one thing is true of another; that what is true of the whole is true of its parts; and that what is true of the parts is true of the whole. In the suppressed reasoning of normal thought we are, therefore, often mistaken, and often draw wrong inferences. What is true generally will, of course, hold good of disturbances. On the strength of one case we assume a certain attitude towards other cases. Often we are justified by results; sometimes not. In this way men constantly suffer pain when they might register pleasure or be indifferent. In practical life, an intelligent point of view in this matter is not sought after, and yet such a point of view is so important that considerations such as are referred to in this chapter, should revolutionise men's likes and dislikes.

144.—NEURAL DISTURBANCE IS ABSENT FROM NORMAL DEFENSIVE ACTIVITY.

My coat has been splashed this morning by a passing omnibus. When later on I notice the dried mud spots, I forthwith proceed to brush them off.

My view, as has been explained, is determined by organised needs. Though I instantly remove the marks, it is not true that their presence gives me pain, or their absence pleasure. My action is normally decided by the fact that I have previously acted in this manner in accordance with a need. If I had analysed the feelings on that occasion I should have observed nothing which differentiated this action from any other action such as is confessedly indifferent. Again, walking along a thoroughfare I perhaps have to avoid a heap of stones; but that brings me no pain. Having encountered stones and other obstacles before, I avoid them with perfect indifference. It is not a question of the unpleasantness of the mud spots or the surmounting of an obstacle; but a matter of organised reaction. As well might we say that pleasure brought us to act as we did, for the feelings were without perceptible tone. Here is another illustration. Something is irritating my warm palm. I have to choose between continuously attending to the uninteresting feelings or removing them and continuing my trend of thought. Here, unlike to the instance of the coat, the solution is urgent. Is it, then, dislike of pain which normally makes me soothe the affected portion? No; only, or at all events partly, custom. As soon as I feel the irritant I instantly, in agreement with organised reaction, proceed to deal with it summarily. Once on a sultry morning, walking across the fields, I allowed the flies freely to congregate on my face. Swarms of them explored its mounds and pits. Both the quality and the aggressiveness of the feelings differed surprisingly according to the parts affected, and in some instances it taxed me severely to remain unmoved. Such cases as those last referred to, would, therefore, create some pain normally; that is, produce a neural disturbance. In accordance with this, persons habitually exposed to discomfort come, through habituation, to bear much without feeling any corresponding strain. They become, for instance, so used to the cold that they think very little about it. Trouble is with them too frequent to be closely inspected, though they are often much more pained or disturbed than their judgment allows. The lesser pains appear like pleasures to them, routine bringing them to undervalue their sufferings. Hardships of many kinds are thus slurred over by those accustomed to them. However, repeated inhibition obliterates to a large extent the neural disturbance, owing to the nervous system becoming accommodated thereto, though pains or pleasures often exist in some degree without being singled out for contemplation.

Our hostile or friendly attitude towards an object is, therefore, no proof of the presence of a disturbance, since in the majority of such instances we are, properly speaking, indifferent. We act in these cases organically, and not as the result of a neural disturbance. The explanation of the popular belief to the contrary has been given in the last section. Because on important occassions a hostile attitude is connected with pain, or a favouring one with pleasure, it is argued that this holds good in every case, and that only the degree of pleasure-pain changes. The reasoning is ill-founded. There is no neural disturbance, and, therefore, neither pleasure nor pain. The reaction is organised. There need be no motive, no choice, no act of will, no thought, no deliberation, no awareness, intervening between the perception and the action. [*Examine cases of this nature which should plentifully occur to you; watch especially the feeling factor.*]

In all the above cases there might have been complete awareness; yet this would not have changed the issue. If some feeling, some sensation or some thought develops which does not appeal to us and which interferes with some thought or action of ours, then the particular feeling, sensation or thought is simply removed. In such processes, however deliberate, no disturbance is traceable. A disturbance would develop if our thought or action were permanently checked by something uninteresting.

145.—NORMAL THOUGHT AND ACTION ARE NEUTRAL AS REGARDS PLEASURE-PAIN.

The fingers of my left hand hold the note book in which I am writing. [*Examine experimentally.*]

The feelings here appeal to me indifferently. I feel no tendency to take away my fingers or to keep them there; only the purpose which guides me determines whether they shall maintain their position or not. All normal thought or action is thus neutral. We tend neither to shun it nor to seek it.

Pleasure-pain is distinguished by a partial or a total suspense of inhibition and by the presence of a disturbance. Where there is no such suspense, there is, accordingly, no pleasure-pain. Hence our normal reactions are indifferent, except as regards the ends which they subserve. This may be made more evident by a reference to the previous sections. We there learnt how deliberate inhibition changes the pleasure-pain value of feelings and sensations; how organised reaction makes easy what was once difficult; how there is consequently a general tendency for actions to reach the level of indifference as regards pleasure-pain. The organism, besides, is not disturbed by everything. Such processes as the opening and the shutting of the eyelids, breathing, swinging the arms in walking, are initially immaterial, except so far as our needs are concerned. The normal flow of thought from point to point is likewise indifferent. The neural system remains unaffected by these movements, and our environment to a large extent reconciles us to multifarious activities. In walking, in talking, in the exercise of our senses, the point of indifference, except as to needs, is the normal point, and training only accentuates this condition. A navvy, a woodcutter, or a shunter, apart from a seasoned nervous system, stands shocks unconcernedly which would stagger many a man more gently nurtured. The nervous system has here, as in similar instances, become adjusted to its environment, and as a result, there is no pleasure-pain.

Thus there seems no foundation for the prevalent opinion which holds that pleasure-pain is a constant or an abiding determinant in the human organisation. That belief is based on wrong inference. From evident facts conclusions have been drawn as to less evident occurrences, and these conclusions are here shown to be erroneous. The changes produced by neural adaptation, and the data which are too minute or obscure to be readily analysed, were misconstrued.

Few writers allow for neutral activity. See Bain, *Emotions and the Will*, 1875, p. 13; Ribot, *Psychology of the Emotions*, 1897, pp. 73-9.

146.—THE RELATION OF THE EMOTIONS TO NEURAL DISTURBANCES.

The relations of the emotions to pleasure and pain are various and can be arranged in several groups; but if they are to be closely connected with the subject of this chapter, they must be presumed to accompany neural disturbances. If we encounter anywhere such states as cannot be traced to a disturbance, we must conclude that pleasure-pain is absent, or, if the facts are inconsistent with this, that the theory here advocated is not correct.

Let us start in connection with the last section but one. We there saw that a hostile or a favourable attitude is reconcilable with the absence of a disturbance. If we continue our inquiries along this line we discover that such attitudes are often pronounced without having any pleasure-pain contents. I may, in spite of all effort, be unable to bring myself to do a certain action. I cannot sustain the thought of it for more than a moment at a time. Repeatedly I find the stream of thought deflecting till I am convinced of the hopelessness of the endeavour and I bow to the inevitable. The task itself, the running counter to a petty habit, for instance, is trifling. I am sure that no evil consequences are attached. On the contrary, from the point of view of prudence, of self-respect and morality, I am urged to proceed. The problem here, as pointed out in sec. 139, is not one as to pain; it is one of inability. Owing to our half-hearted attempts and double-faced inclinations the nervous system has gradually been so adapted as not to react in the way we desire. At last, incapacity sets in, and this can only be overcome by an opposite course of training. When, therefore, a child, on a cold morning, shivers and whines rather than look round for his coat, this is not because the cold is less disagreeable than the searching for the coat; but because activity is hampered.* *Organised reaction*, as we saw in ch. 3, *affects our life in everything: here it eases what is difficult; there it makes easy things difficult.* Violent aversion is thus often painless and emotionless, and so it is with violent attachment. A man is a slave to drink; he has been driven well-nigh mad by intoxicants; he hates his inclination with all his heart; and he knows that it has wrested from him all that he holds dear—his good name, his wealth, his self-respect and his health. Yet so unable is he to withstand the temptation that he gladly signs away his liberty for a period, in the hope to escape his evil genius. It would be foolish to think that there is passionate love for intoxicants here. Superficial analogy and a blindness to the effects of organised reaction mislead the judgment. The strong attachment is primarily grounded in an inability to resist. Under the influence of certain stimuli the nervous system tends more and more to yield as drinking is indulged in, until it is paralysed, inhibition having become impossible, or nearly so. Such a change entails no increase in emotional development. On the contrary, the latter is possibly decreasing till it reaches the zero point. The action may be almost automatic. It depends on our education and on our perennial activities, assuming just social conditions, how far we shall be masters of ourselves.

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* It has been suggested that in so far as our volitions are powerless, we have to deal with what falls outside a man's personality. This may be plausibly maintained in cases of insanity; but otherwise the view is indefensible. At every point our volitions are determined by results which we have a reason to expect, and not by those we might desire, and to insist upon the above contention, is to deny that any man possesses any personality at all. No doubt, as Paulhan would argue, the most perfect individual is he whose totality of actions strictly agrees with one fundamental need; but that, he would allow, is an idealistic criterion, not a psychological one.

What is true of these two instances is true of all similar ones. The man to whom duty, religion, art, science, politics, business or pleasure [*note and check the method of generalising*] is all in all, is physiologically in the condition above depicted. He, too, has strengthened his inclinations. It is this which makes him lord over himself. Should he wish to act against his organised inclinations, he would meet with analogous difficulties to those which have been described. For the same reason, on account, that is, of the nature of his developed nervous structure, another man is the victim of ceaseless vacillation, and lives in a land of if's and but's.

A hostile or a favourable emotional attitude towards objects is now more easily explained. First, we meet a neural inclination or disinclination which is capable of growth. This positive or negative tendency accompanies the emotion, and the feeling which is present argues some important difference in which lies the factor we are seeking. When we have grown to act or to shrink from acting in a certain manner, we are face to face with a normal process. The violence is observed by the spectator; but it is only an example of developed strength. When, again, emotion is present, we have an additional element, for in this case the nerves are thrown into a state of agitation. If we love a thing we are drawn towards it; if we hate a thing we are driven away from it. Emotion argues nervous excitement or warmth, not neural disturbance. For this reason it may be that the repentant drunkard only thinks of his weakness in the presence of intoxicants, and thus the child does not really feel angry with the coat. In love or hate, however, in accordance with sec. 109, the topic has a hold on our thoughts in proportion to the warmth of the emotion. The topic cannot, therefore, be dismissed, except with difficulty, and the presence of an emotion consequently indicates that to the factor of inclination, which is possibly normal, has been added that of active excitement. Thus the thoughts of a bad man, as of a good man, flow generally in one direction, and each finds it difficult to think with the man of opposite notions. In instances like this, the trend of thought is not determined by a neural disturbance or by an emotion, and hence disturbances will often indicate the presence of active neural excitement in addition to neural inclination. When emotion or excitement accompanies a favourable attitude connected with a disturbance, we are said to be joyful; when a hostile one, depressed. The emotion by itself, as far as the feeling factor is concerned, is neither pleasurable nor painful, and the difference between a neural inclination and a neural disturbance is fundamental, like that between equilibrium and absence of equilibrium. The emotions or feelings are classed as pleasurable or painful because of the neural disturbances which they accompany, and otherwise they bear no marks which would induce us to regard them as being pleasurable rather than painful. In their nature they are neither the one nor the other, but indifferent. Even the warmth of the emotion is frequently illusory, since it is confounded with the greater inclination.

Jeremy Bentham, in his *Principles of Morals and Legislation*, 1823, thought otherwise. "Pleasures . . . . and the avoidance of pains, are the ends which the legislator [and the moralist] has in view" (i, p. 49). And the value of each pleasure-pain is measured, according to him, by "(1) Its intensity. (2) Its duration. (3) Its certainty or uncertainty. (4) Its propinquity or remoteness. (5) Its fecundity. (6) Its purity. And one other; to wit: (7) Its extent; that is the number of persons to whom it extends" (p. 51). Psychologically Bentham's view is untenable; but it is shining gold itself beside the rival theories which have their roots usually in religious prejudice and class privilege. See also in this connection John Stewart Mill's *Utilitarianism*, 1864, and Sidgwick, *The Methods of Ethics*, 1893, bk. 2, ch. 6.

The hedonic or pleasure-pain calculus is here face to face with a subtle difficulty. It has to apportion what is respectively due to *capacity*, *inclination*, *excitement* and *disturbance*. The average judgment errs seriously under the circumstances, as it confuses inclination with passion. Because strong passion often goes along with inclination, men at once argue that inclination is a measure of passion, and passion of neural disturbance. There is no such direct relation. The man who has, metaphorically, worked his way into a dark jungle or to the sunlit top of a precipitous hill from which it is difficult for him to return, is supposed to be a prey to an overwhelming passion and to be leading a life either of torture or delight. Passion, in such instances, is almost incomparably smaller than the neural inclination, and pleasure-pain and emotion are present only to an insignificant degree. This holds good generally of such aptitudes as are far-reaching and capable of guiding life as a whole. It is inability and not dislike which prevents men leaving the narrow path of particular organised trends; it is neural inclinations and not emotional likings which hold them there. Actions and activities are, accordingly, proclaimed pleasurable or painful, a scale of desirability is drawn up and men adjust their lives accordingly, and yet the reasoning is largely a fabric of the fancy. The traps disclosed by psychological analysis are of such a nature that an uninstructed desire for happiness is utterly unable to detect them.

The emotions are not always connected with disturbances. In anger, fury, rage, the element of pain is scarcely present. It is certain that I cannot truthfully account for being angry, by saying that I dislike or like to be angry. Many a time I have interrogated myself; but neither reply is conclusive. I am angry in consequence of being pained, perhaps. But is anger itself painful? A careful inquiry here classes anger and its cognate emotions under neither heading—not that of semi-opposed disturbance nor that of opposed disturbance. It is a hereditarily determined complex motion of nervous relief, such as is afforded by laughter and crying, by screaming and dancing. Its end is to recover neural tranquillity.*

Another group of emotions requires a different explanation. In wonder, surprise, awe, admiration, horror, there seems primarily a state of neural ecstasy. We are struck dumb; the field of attention is narrowed and its current is forced into one direction, while customary activities are inhibited. When, therefore, the subject which takes us by surprise leaves us unmoved, the state should be considered as indifferent; when the object is interesting, the condition may be delightful; and when the object is terrible, we call it a state of horror. These emotions receive their colouring of pleasure-pain from the other emotions raised by an object. [*Distinguish inclination with or without emotions, with or without pleasure-pain. Examine yourself when angry or joyous. Observe the motor aspect in connection with the emotions.*]

The question of the emotions has been hotly debated in recent years. On the physiological side, James, *Psychology*, 1890, ii, ch. 25, and Lange, *Ueber Gemüthsbewegungen*, 1887, have investigated the subject; but the introspective side has been almost entirely neglected. One party insists with Ribot (*The Psychology of the Emotions*, 1897) that "it is not reason which uses passion, it is passion which uses reason to reach its ends" (p. 440). Another party regards emotion as a fourth psychological dimension, and urges that "emotion is introspectively distinct from cognition, pleasure-pain, and conation" (Irons, *The Nature of Emotion*, 1897, p. 256). Then come the Herbartians, who explain away the emotions. Thus Herbart, *Encyclopædia*, 1831, p. 308: "As the movements of ideas facilitate or obstruct each other, so arise the manifold emotional states, feelings and appetites." "They are not objects of presentation; but they indicate how the act of perception takes place" (*Psychologie*, 1824, ii, p. 76). He speaks of some emotions (Affecte) as epiphenomena (p. 101). He says that the power of a passion "lies evidently in the power of the dominating idea" (p. 104). Similarly, in his *Lehrbuch*, 1816, p. 29, he says: "Feeling and desiring are modes of ideas." Godfernaux (*Le Sentiment et la Pensée*, 1894) with other writers, holds a mediate view. "We understand by sentiment a phenomenon of consciousness which is vague and diffuse, and which corresponds to a vague and diffuse movement; and, by thought, a phenomenon of consciousness circumscribed and clear, corresponding to a localised and systematised movement. The borders between these two classes of facts are very uncertain, and it is impossible exactly to determine where feeling ends and thought begins" (p. 196). Münsterberg, again, contends that "sensations are perhaps the most essential factors in emotion, and are not chance accompaniments" (*Die Willenshandlung*, 1888, p. 70).

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* Sully finds in anger an "intense element of pleasure" (*Human Mind*, ii, p. 94), and he traces this pleasure to the general heightening of bodily activities. I can discover no pleasure in anger. [*Can you?*]

Considering the wide range and great complexity of the emotions, it is only natural that psychologists should have substituted classification for close analysis. We shall, therefore, quote only a few opinions besides those mentioned in sec. 138. Bain, *Emotions and the Will*, 1875: "Feelings are divided into sensations (including muscular feelings) and emotions. Sensations, as such, are primary and simple; emotions as such are secondary and compound. The pleasure of a fragrant odour . . . . is believed to be a direct and immediate consequence of the physical stimulation; the pleasure of a fine statue is a derived and compound effect; in its formation, there intervened a process of education or acquirement" (p. 69). "The sweetness of a sound is a sensation; the pleasures of a musical composition are accounted emotions" (p. 69). Höffding, *Psychology*, 1891, pp. 282-3: "By emotion is understood a sudden boiling up of feelings. Passion, . . . on the other hand, is the movement of feeling become second nature." James, *Psychology*, 1890: "The bodily changes follow directly the perception of the exciting fact, and . . . our feeling of the same changes as they occur is the emotion" (ii, p. 449). "We feel sorry because we cry, angry because we strike, afraid because we tremble, and . . . we [do not] cry, strike, or tremble because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colourless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we should not actually feel afraid or angry" (ii, p. 450). My own observation strongly confirms this. Lange's book (*Ueber Gemüthsbewegungen*, 1887) is primarily descriptive. The following passage bears out what I have stated. "Indeed, one may without exaggeration maintain that, from a scientific standpoint, we are completely without understanding of the nature of emotion, and that we do not possess a shadow of insight as to the general characteristics of a passion [such as fright or joy], or into that which constitutes the various emotions" (p. 9). "It is to the vaso-motor system that we must attribute the emotional aspect of our life, our joys and sorrows, our happy and unhappy hours" (p. 76). Marshall, *Pain, Pleasure, and Æsthetics*, 1894: "Emotions . . . . may not improbably be found to be complex co-ordinated instinct-feelings" (p. 64), and instinct-feelings "indicate the mental states that correspond to instinctive activities" (pp. 63-4). "Emotions" are "(relatively) fixed psychoses corresponding to fixed co-ordinations of instinctive activities which arise upon the appearance of definite objects" (p. 65). Mosso, *Fear*, 1896, contains a close psychological study of Fear. Spencer, *Psychology*, 1890, i, p. 599: "When a particular plexus is excited, it immediately excites the mass of kindred plexuses with which it is organised—the result being that the feelings proper to this mass of excited plexuses are aroused, and in their multitudinous but vague aggregate, constitute the accompanying emotion." Sully, *Human Mind*, 1892, ii, p. 57: "Emotion is in general describable as a mass or aggregate of sensuous and representative material, having a strongly marked and predominant concomitant of feeling or affective tone." See also Sergi, *Les Emotions*, 1901.

147.—FEELING PAINED, AND IMAGED PAIN.

Some one, we will say, unjustly accuses a friend of yours of a questionable financial transaction. You are greatly pained and grieved, and worry yourself about the matter. You do not like to be pained; and you do not like grieving as such.

Crying is, as we saw, an attempt at relief. What is feeling pained? You would rather that the accusation had not been made. The withdrawal of the charge would bring you joy. The thought of the libel disturbs your neural equilibrium and excites you. What is to be done? What will your friend think? How he will be pained! You are depressed at such a suggestion having been entertained. Your affection for him is outraged by such an act. You are full of anxiety.

Now grief is the consequence of such a state. The momentum produced by the excitement compels us to harp on the topic, while making us impatient of every other thought. To think calmly of other issues after a great event, is impossible to the average mortal under average circumstances. Only a trained power of inhibition coupled with a healthy nervous system, will enable us to counteract to any considerable degree a neural disturbance. Suppression being out of the question, or else we must assume that the grief ceases, there appears to be no alternative but to keep on thinking about the misfortune, especially since our helplessness and the thought itself are added fuel. This tendency is, however, normally resisted. Our resources become exhausted; we recognise the futility of brooding over the affair, and at last we naturally tire of the subject (sec. 28). Our way out of the unpleasant alternatives is simple. We relax our normal efforts and become listless. Our thought is, accordingly, feeble; it excludes strenuous thinking and, by implication, reference to our friend, as also all renewal of excitement. We live in a lower key for a time, as a sick animal will do. When the grief, especially with the calm which comes of rest, has lost much of its hold, we gradually return to normal activity. Meanwhile our general outlook and much of our thought are slightly tinged both by the initial occasion of our trouble and by the physical state induced thereby. I say advisedly "slightly tinged," because the physical contrast suggests a contrast of feelings which does not exist. We are not unhappy; but we vegetate. We dreamily live without troubling ourselves about happiness or misery. Our being is in abeyance, as when we feel the necessity for perfect rest. For the time being we give up our right to meddle with the world's affairs. In all this there is little planning. We naturally fall into the quiet mood, and naturally we persist in it. Whatever we have to learn we learn incidentally. Passive grief, then, is not, properly speaking, a simple painful state; it is rather a lowering of our level of activity for the purpose of recovering neural tranquillity. To the strong soul, however, there is open the more excellent way of manly resignation.*

The essential points to be observed are that a disturbed condition is a deflection from the normal; and that neural states, when disturbed, tend to regain their customary equanimity. Under these circumstances we say that we are pained.

Why do we dislike this state? We have seen that it is normal to man's physical constitution that he should concern himself with a misfortune until it is relieved. Now the thought of a mishap, a serious fright, for instance, sometimes recalls the event so far as it is painful and we then re-act it in part. Hence the thought of something distasteful will sometimes coincide with what is distasteful, and for this reason we shrink from it, while, at the same time, through organised reaction, we have become gradually accustomed to spurn and dismiss such a thought. There will, therefore, be a tendency quickly to drop that which leads to, or is connected with, anything painful. The more unpleasant the re-collection, the more summary will, of course, be the dismissal. Since also our organism, when not morbid, is uninterested in disturbing occurrences as such, we do not dwell on them. Other wants, normal in their nature, crowd in and expel the unwelcome guest. [*Secondary pleasure-pain should be experimentally studied.*]

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* My temperament is so stoical that grief seldom comes near me. I, therefore, lay little stress on the above analysis of grief. Perhaps some impulsive psychologist will make an experimental study of the subject. [*Study the nature of grief.*]

Of course, our judgment often misleads us. We act sometimes as if we were much pained, when we are not. In such an instance pain is non-existent, for the shrinking is acted and not real. We erroneously consider a notion unbearable; but the unbearableness is only in the judgment. Hence, except when we discipline ourselves to undergo what at first we only imagined, the supposed disturbance is a fiction. The intensity or aggressiveness of pleasure pain, too, is always an open question. To-morrow we shall recognise the simulation of to-day's pain, and in the light of better judgment we shall observe what obstinate error alone could fail to remark. [*Examine yourself very carefully when much tired or ill or in low spirits, and in the opposite moods. Also when you think of pleasant or unpleasant events.*]

148.—PRINCIPLES RIDE ROUGH-SHOD OVER DISTURBANCES.

A man is watching some boys who are boating. Their loud laughter, their flushed faces, their restless eyes and their general animation bear witness to their whole-hearted enjoyment. They ought to have been at school; but they could not resist the invitation of the smiling day and the sunny river. To our spectator, boating is no temptation, though in his own way he is able to appreciate it as much as they. If, however, it be a choice between the river and the performance of a duty, he unhesitatingly inclines to the latter.

After what has been said in the preceding sections, this instance will not appear as extravagant as it might otherwise do. Why does he incline towards the duty rather than towards the boating? It might be replied that the duty affords him more pleasure or more satisfaction than the boating; but this is not the fact. Let us analyse the case more in detail. The duty is to go home and write a promised answer to a letter. The matter in itself has only to do with a trifling transaction, the delay of which would be immaterial. In writing the note there is no appreciable excitement of any kind, pleasant or otherwise. The river, on the other hand, offers exquisite enjoyment, and hours of it. Yet without any struggle, without weighing arguments, without reflection, without excitement, without disappointment, he turns homeward. With all its allurements the river has no fascination for him. Imagine, however, no duty to stand in the way, and he enters enthusiastically into the sport.

Such are the facts, pure and simple. What is their explanation? That his decision is due to the greater pleasure the duty holds out, is an untenable theory in this case. That pain has any appreciable influence here, must be denied. On the face of it, he acts in an organised fashion. He goes straight for the duty; he proceeds as he has proceeded before; and his action is unaccompanied by any emotion or reflection. The decision is as readily arrived at as if both courses were palpably indifferent.

We have seen how, by inhibition, things which have an immense disturbance value, often lose it altogether; how we can fix or ignore them; how if we so will, they become meaningless from the pleasure-pain point of view. The greatest possible prospective pleasure, given developed nervous strength, can thus lose all its charm, possessing no more power to move us than if it were dead or forgotten. We contemplate it placidly as we might a psychological curiosity. Under these circumstances the pleasure of boating and the performance of a duty are reduced to the same simple category, and each leaves us unconcerned. Deliberation and comparison are absent. The measure we apply is one of principle and not of pleasure-pain, while we are guided by general and organised considerations and not by passing special considerations. It is not that the duty triumphs over the pleasure; but that an organised inclination, disciplined to accord with some general principle, carries the day.

In the instance under discussion, the effect is not produced by deliberate or thought-of inhibition. On many prior occasions the man had practised inhibiting courses of conduct which were opposed to duty. Gradually inhibition grew more easy, until at last it became organised. As soon as a desire then arose which conflicted with duty, so soon was it dismissed. Except for duty's sake, it was difficult for him not to act in this way, and for the same reason, his thoughts ran on the problems of duty. On account of a confirmed inclination the notion of boating, under the circumstances, appears pale and indifferent when regarded from the emotional and imaginative point of view. It has no attraction whatever. Nor has the thought of duty anything to recommend it in the particular example. Provided that his notions on the subject have remained unchanged, he simply proceeds to the performance because he has proceeded thus in the past.

A consideration of sec. 109 makes it obvious that strong excitement is usually unprofitable to the human organism. An emotion, we there learnt, tends to persist in proportion to its warmth, if we except shallow persons and dream-life. Hence, instead of being able freely to disregard topics, we have no option in the presence of strong excitement, but to develop them, and that makes normal thought impossible. Instead of progressing with whatever task we have in hand, we are forced by excitement to linger by the way and ponder over otherwise unengaging trifles. If the field of attention were like the limitless ocean of space, it would be within the range of possibility to follow out every conceivable line of thought or temptation. As it is, attention being rigorously limited, a large quantity of imaginable arguments, reasons, motives and temptations do not, or at least are not bound to, develop. They are eliminated by the struggle for the field of attention, and we march, therefore, swiftly from position to position.

We understand now how some psychologists quietly analyse the pleasant humour of the company they are in, instead of merely enjoying it; how they listen to a great singer with nothing but a psychological interest; and how they take an argument to pieces instead of judging of its value. Such investigations are far from implying callousness. These psychologists possess perhaps as keen a relish as anybody for humour, song and argument. Only they have deliberately, or incidentally, disciplined themselves to psychologise freely. By often analysing, the power, as described in ch. 3, has insensibly increased until their ability has become highly specialised.

What is true of the moral man and the psychologist holds good, by parity of reasoning, of men generally. *Wherever we find an absorbing pursuit, there the emotional and the pleasure-pain value of objects is continually ignored.* Without deliberate inhibition we then pass by temptations with indifference. We have seen that this must and does take place in normal thought, and, accordingly, we must allow that pleasure-pain has not the decisive and perpetual influence attributed to it. Its proper function is readily defined: pleasure, or the attempted preservation of neural disturbance, makes, within certain limits, for private and public robustness; pain, or the attempted escape from neural disturbance, similarly restrained, serves the same object, as we have seen in sec. 142. By training, pleasure-pain may be rationalised; and this must be one of the aims of education. Hearty enjoyment could then be encouraged without fear of extravagance, as also necessary stoicism. The primary intention of the reactions which follow on pleasure-pain is, largely by means of inherited measures, to protect the organism against violent attacks.* Natural selection has accordingly favoured nervous systems which are duly attracted by the good, and repelled by what is evil. Indeed, were the system not sensitive to what is beneficial or hurtful, our race would have no chance of existing at all. If we tend away from the normal condition, it is because of the tendency of the organism to react in that manner. When the tendency is in the contrary direction, that is to say, when we hasten towards the normal state, we call the impelling object painful. To say that we like what is pleasurable, is to say that we like what we like, or that *A* is *A*. To say that we like what is painful, is to say that *A* is not *A*, unless, indeed, we use the terms "like" and "pleasure-pain" in various senses. When we speak of pleasure-pain, we assume accordingly that a neural disturbance has taken place, for otherwise unnatural antitheses are easily established. [*Test this section experimentally.*]

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* According to Horwicz's general doctrine in his *Psychologische Analysen*—and Horwicz does not stand by himself—all the senses as well as thought are bare modifications of the sense of pleasure-pain. In connection with this theory, the following may be quoted from Höffding's *Psychology*, 1891, p. 288: "As smell and taste facilitate a pre-examination, which prevents anything injurious to life from being received into the alimentary canal, and as smell gives notice of the approach of the enemy or of the prey, so too, sight and hearing are from the first in the service of instinct." In fact, so far back as Berkeley this was recognised: "We regard the objects that environ us in proportion as they are adapted to benefit or injure our own bodies" (*New Theory of Vision*, 1709, sec. 59). And so James, *Psychology*, 1890, ii, p. 17[illegible]: "Even to-day the main function of the peripheral organs of our retina is that of sentinels, which, when beams of light move over them, cry 'Who goes there?'"

Prof. James (*Psychology*, 1890, i, p. 144) says: "If pleasures and pains [as feelings] have no efficacy, one does not see . . . why the most noxious acts, such as burning, might not give thrills of delight, and the most necessary ones, such as breathing, cause agony." The meaning of the same feelings varies, I hold, with circumstances, contrary to what James assumes. If I abstract from the thrill the violent physical change of a particular kind which accompanies it, I am at a loss to find a name for that which remains: it might be an agony, for aught I know. James' theory implies that a man might shriek, be shaken to his foundations, take hurriedly to flight, rid himself of an enemy, and yet be contemplative, calm, unmoved and attracted. Let these latter elements be eliminated from the thrill of delight, and we have left something resembling the famous cat's grin without the cat. Surely, on James' hypothesis of a feeling added to an act, there is no reason why bodily agony should not be accompanied by thrills of delight, *i.e.*, a buoyant desire to maintain the agony.

149.—MOODS LARGELY DETERMINE THE DRIFT OF THOUGHT.

My head aches badly. It has been worrying me for several days. I cannot think; I am in a depressed mood; and my thoughts are gloomy. I do not like being in this state.

Where there were no feelings previously about the head, I now note some. They have come without my bidding; they are staying independently of my wishes; and they will disappear at their own sweet will. They are the result of certain changes or derangements in the nervous system. They possess no meaning apart from these changes. In themselves these feelings are neither pleasurable nor painful, and it is the accompanying circumstances, some of which they represent, which lend them a fictitious value. Were it not for these, the feeling might be wholly indifferent as are those connected with my sitting while I am writing at the present moment. Being, however, related to important neural states, they loom large. Their unimportance is readily proved. I but proceed to study them for a few moments, and their pleasure-pain pretence is instantly suppressed, for while the feelings continue, the pain has ceased. Like the moon, the feelings shine with borrowed light.

Co-existing with the headache is an inability to think freely. My surroundings and my life and existence bear a striking resemblance to a mist. I seem to be dozing all the time. As the distant sea only murmurs, while we hear it crash and boom as we draw near; so the normal vividness of thought seems far-off and appeals to me but faintly. If I were to remain for ever in that condition, not another vigorous notion would bud within me. The sensations and feelings have, of course, nothing to do with this dull state on the thought exchange. An additional argument in favour of this view may be found, if required, in the fact that such a state of torpor often overcomes us, without being accompanied by the aggregate of feelings we call a headache.

Thought is circumscribed in other ways. In secs. 109-11 we studied the part played by excitement. Under its influence we continue feeling, reasoning and imagining when the ostensible occasion is past, and the same thing is true of the present case. As the derangement of the headache is present, neural activity is concerned with that. Though we think now of this thing and now of that, we tend, because of the persistent excitement, to return to the thought of the headache. Hence we are constantly revolving the headache in our thoughts, and we are never long away from the gloomy subject. We do not choose the theme; we should prefer thinking of what is pleasant; but it is imposed on us. The presence of the neural excitement is a factor forcing the matter incessantly to the foreground. While we are thus liable to be unduly concerned with what is troubling us, there is a contrary inclination to be considered; that is to say, as a weight strives to reach the centre of the earth, so there is a dogged tendency on the part of the neural system to regain its quiescent condition.

One method of using up the attention, as we have seen, is to try to remove the headache. In this way we do more than justice to the excitement, for we surreptitiously introduce hopes which are in themselves agreeable. A gleam of sunshine is thus gained, and the forcible discharge in itself gives some ease. Any vigorous activity ordinarily helps; but that connected with the neural centre afflicted yields relief most readily. If, in consequence of this, the abnormal tendency abates, the normal one increases in power correspondingly, and as that is most likely to happen when we make an extra effort to recover ourselves, such a state tends, organically, to develop. As the result of natural selection, the nervous system drifts in that direction largely of itself.

Besides the incessant occupation with the headache, due to the neural excitement, we learn of another channel of relief. It is obvious, as in crying; or it may be hidden: the eyes, the eyelids, the forehead, the muscles of the face, the heart, the lungs, in short, nearly the whole organism may be involved, the tension being widely distributed. This activity relieves the affected centres, and is to a large extent instinctive; or, at all events, there is a predisposition which makes such discharge normal under the circumstances. If this be so, however, it must react on our thoughts. It will tend to fix the attention on the headache, and keep it there.

There is yet another direction into which our thoughts tend to flow. All cases which are similar to those of the headache; all sensations which are consistent with the excitement and the peculiar general organic disposition, will take precedence over normal thought (sec. 109), and thus gloomy adventures of every kind will by preference attract us. Since the attention is bound to find employment, and since normal thoughts are out of the question and the subject of the headache is exhausted, we revolve related subjects, such as other headaches, ills generally, disappointments, etc. The stage of thought, like a chamber of horrors, is in this way sometimes packed with gruesome figures. One dismal apparition follows another, and a long procession of monotonous anxieties harrows our feelings. The darkness is deepened till there is scarcely room for the faintest beam of light. Even when the headache is gone, the twilight of despair yet haunts us. It is not that we like these gloomy guests, or that we have invited them. We do not love them, and we do not invite them. An hour's sleep would be so pleasant; but they will not depart. There are other scenes which we are trying to revive and retain; but in vain. Were the discharge of energy in our keeping, we might bring pleasant subjects to the front, or we might reduce the discharge till it just sufficed to fit us for our work (sec. 134). Our likes, however, must stand aside. The attention must be occupied, and can only be occupied with unprofitable topics. Our needs, accordingly, are not the exclusive builders of the track which our imagination is following, and our desires often represent nothing more than the normal neural tendency to regain or escape regaining the lost equilibrium. It seems certain that the above explanation of the gloom, as being the result of excitement, is the correct one, and that the issue was not determined by desire for pleasure or fear of pain. Even organised reaction plays an insignificant part here, for the nature of the excitement is one important factor, while the other is the necessity for thought. For the same reason we must equally reject the notion that I selected the topics or that they were due to a process of ideational association.

What holds good of a mood thus created, holds good of all moods. The waves of excitement, when we have been hurried into a violent passion, will not at once subside, however large a quantity of the oil of reason we pour upon them. In such a mood the noon-day sun itself appears dull and cold; a pall hangs over everything; and our dearest friend is not what he should be. We charge the daisy with pride, and the wild rose we taunt with being an abandoned pleasure-seeker. In a spirited mood, on the contrary, the opposite view is taken of the world. The very mud in the street speaks, whispers soft nothings as we tread on it, and dances as if in sport. Death has no sting left. Others' misery leaves us unmoved.* We reproach ourselves for our levity; but how hollow is the reproach. We dismiss what is unpleasant, and what would otherwise have irritated us, is now a superb jest, provoking laughter. Strictly speaking, this uncontrolled joy does not result from any writ by which we may have summoned it to the sessions of thought. The mood we are in,—the peculiar nervous excitement due to the prick of a need or the state of the organism,—explains the interest with which we regard even the meanest topics, and we can no more arbitrarily dismiss this condition of thought than we can its brother born of gloom. Two extremes have been depicted; but the argument holds good generally. We are, as beings goaded by needs, always in some mood or another. Indeed, many individuals, for long periods together, remain in some pronounced mood. The current of our thought is for this reason determined primarily by our needs, and secondarily by the consequent excitement. Pleasure, fear of pain, and choice, are not the great powers which decide whither our thoughts shall commonly drift; this is determined by our organised needs and the nature of the neural mechanism. Our analysis reveals an apparent exception to this, for in ch. 5 we saw that ordinarily little excitement is present. In this restful mood we have a certain amount of liberty, though the excitement involved in recency is the support for any train of thought. Moreover, the depth to which we feel, is determined by our organism. Our passions may be but passing clouds, hiding the light for a few moments, or they may rage tempestuously for considerable periods. The various stages of individual development—from birth to death—have corresponding moods, and these, subject to the underlying needs, are the great rulers in the realm of thought (sec. 152). [*Determine carefully the drift of your thought in various moods. Practise also to think out of relation to a mood, and try to suppress and encourage moods. Do not forget that the general facts must be arrived at by examination, and that "opinions" mislead.*]

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* That is one reason why young children appear callous.

One day I repeatedly felt that everything seemed to act as an irritant to my temper, and that uncharitable thoughts were in the ascendant. After due reflection I discovered that some unpleasant event of which I heard that morning had left its sting behind in the form of a disagreeable mood. Here the mood may be considered as corresponding to a disturbance of neural equanimity. Certainly the thought of the event—visual, audile, verbal, tactile—had nothing to do with my bitter reflections throughout the day. As with this somewhat abnormal condition, so with much that is normal. Dyspeptic, choleric and weak-nerved people are perpetually influenced by their nervous state; and so are those who are of a robust and buoyant constitution. In the same manner, the innumerable many-coloured prejudices or inclinations which few people are without, sustain a particular class of thought. Interest, attention or absorption act similarly. The effect of recency and memory is but one aspect of these moods. So also our genuine wants guide and tone our thoughts.

On one occasion I received some critical news, and I was much affected in consequence. I noticed that my thoughts were so many frowns. I then began to observe and to experiment. There were the usual symptoms of excitement, though the notion which was responsible for them only developed now and then. I noticed that, on the one hand, there was the tendency to re-develop what was unpleasant, while on the other, indifferent or pleasing thoughts which I had deliberately re-produced were quickly permeated by an atmosphere of depression. A certain physical state, then, however produced, brings forth, favours and transforms thoughts according to a certain plan. Ideas, in the sense of visual and aural images, are, therefore, not the only means of originating certain classes of thoughts. [*Experiment and observation on an extensive scale are easy in matters of passion.*]

150.—CONCLUSIONS.

It will be as well to bring together the scattered conclusions arrived at in this chapter concerning neural disturbances.

(1) So-called pleasure-pain feelings do not admit of being arranged according to pleasure-pain degrees;

(2) nor can so-called pleasure-feelings be divided from other pleasure-feelings or pain-feelings, and so-called pain-feelings from other pain-feelings or pleasure-feelings as regards pleasure-pain quality;

(3) nor can so-called pleasure-pain feelings be divided from indifferent feelings;

(4) nor are feelings ever directly connected with each other;

(5) nor do they give birth to movement of any kind;

(6) nor do they influence movement of any kind;

(7) nor, consequently, can they raise or lower vitality;

(8) but feelings follow or accompany movement;

(9) and they are for the time being classed as pleasurable, painful, indifferent, strong, weak, important, originating and passive, in agreement with the changes in thought and action with which they are found to be connected.

(10) The nervous system has only a limited power of resistance;

(11) its normal work leaves the body free from disturbances;

(12) organised activity is guided more or less by developed inclinations;

(13) organic needs make the brain act as it does:

(14) under certain conditions the nervous equilibrium is disturbed;

(15) it then rights itself by deflecting the attention,

(16) by inhibition,

(17) by a lowering of vitality,

(18) by forcible expression, as crying or laughing,

(19) by thinking of means to right the equilibrium,

(20) by removal of the irritant. Also

(21) ordinary defensive, inclined or preventive action is indifferent as regards pleasure-pain;

(22) inclination is no measure of capacity, disturbance or emotion;

(23) organised reaction, inference and one's point of view, largely influence the nature of reactions;

(24) pessimism is unjustifiable in theory, and, therefore, inapplicable to fact; and

(25) an organised trend, such as is exemplified in walking, typifies indifference; smiling faces typify pleasure—a state where we tend for a time to maintain the disturbance; and sobbing typifies pain—a condition where we strive to regain the equilibrium.

151.—A BIRD'S EYE VIEW.

Needs or functional tendencies normally realise themselves according to inherited and acquired inclinations, and not as the result of disturbances. Disturbances are rare events; they betoken the absence of ready physical or mental adjustment, and they are partly dealt with by inherited reactions, by inhibition, by turning away the attention, and by other means. *We must distinguish one from another: needs, disturbances, capacities, emotions or excitements, inclinations, neural momentum and moods.* Pleasure-pain is to be described as a neural or mental disturbance, and not as an unanalysable subjective state. We must allow for organised reaction and wrong inference, and for the fact that feelings give us no clue to the nature of pleasure-pain. For the compound word pleasure-pain we may employ the term neural disturbance; for pleasure, semi-opposed disturbance; and for pain, opposed disturbance.

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CHAPTER VII

SYSTEMS AS NEED-DETERMINED

All our acts, from *a* to *z*,
Find in needs their fountainhead.

152.—EXPERIMENTAL WILLING.

(1) When I will to move my eyes, limbs or body, it is the action most natural to those parts which results. [*Repeat and test these experiments.*] I note that I am apt to repeat, or recur, to the same movements. (2) Variety of action in experimental willing is with me usually suggested by the rule of contraries, for example, if I have moved my arm to the right, I move it afterwards to the left. To produce an uncommon succession of arbitrary movements is not easy, *e.g.*, it is difficult to pass from movements of the fingers to those of the legs, and from these to sight and then to thought. (3) There are no separate verbal volitions always present as I proceed from movement to movement; where they do occur, they form a link in an organised chain. The persistence and line of the activity is decided by individual inclinations. (4) The following factors exist in arbitrary haphazard willing: (*a*) we have the notion of, or the need for, acting (represented on the non-bodily plane chiefly by an organised feeling); (*b*) the cue to what we are to will is given by the first sensation which happens to arrest our attention; and (*c*) we will what the feeling or sensation suggests, *i.e.*, we carry out the suggestion. The resulting action is along the line of familiar activity. Such experiments as the above possess no elements which are not involved in a train of organised thought —as muttering a formula, or in a complex of muscular action—as when I take off my coat. The use of phrases such as "I will," merely lengthens the act. (5) In the course of the experiment I am able to desist at any moment; hence it is reasonable to suppose that an organised stimulus or need persists while I proceed from step to step (ch. 3). (6) I am not aware of separately willing every step and each part of every step. I merely observe a steady succession of movements with no discernible volitions, notions or feelings intervening. This is a fair representation of normal reactions, the process remaining the same even when we are doing

something which is objectionable to us. (7) The end or aim is conceived of organically, that is to say, dimly and intermittently. For example, a slight feeling develops in my arm at the point which will be moved. Normally we do not think of an end when we act; but if the opposite be true, then since all action displays the same characteristics, thought-of ends exist in all action whatsoever—voluntary or involuntary. (8) When the activity, as a whole, is of recent standing, I re-develop more or less completely portions of the end as well as of the steps; and both of these, not being as yet well assimilated, are re-developed slowly and more or less completely, so that I am enabled to act readily and confidently. By parity of reasoning the vivid re-development of an end and of the steps involved in its execution, is superfluous in normal process, since everything is there re-developed easily and at once, while what is redundant is repressed in the struggle for existence and comfort among primary and secondary units. Hence we do not expect ordinarily to meet with any thought-of end or means, since these have been reduced to their lowest terms. (9) I can easily will what is impossible to carry out, for example, I try to annihilate the pen I am writing with by a stern look; I attempt to flatten a wooden pen-holder by pressing it between my fingers; I will to lift a tremendous weight. Belief in the possibility of achievement plays no part in ordinary action. I proceed to will actions which are out of my range as if they could be performed. I will the impossible as easily as the possible. We act as a rule organically, and we do not stop to reflect or to weigh. If our attempt is unreasonable, we desist; but this we do only from practical considerations. We act because of a pressing need, regardless of belief or possibility. In organised activity these latter are thrown out as unnecessary ballast. For the same reason we may will what we regard as the more painful of two courses. I resolve, in this manner, to do whatever is casually suggested, and I proceed accordingly. As regards belief and possibility, thought, imagination and muscular reaction show the very same characteristics.* (10) I let articulate sounds, regardless of sense, freely escape my lips: oar, weer, con, laugh, log, fear, glue, gin, coroner, can, mine, more, fun, candle, dream, doll, toon, wild, where, want, Solomon, Cinderella, tender, till, keer, colt, darling, nantch, villa, careless, friend, folly, state, frieze, full, grand, eyes, love, pick, noor, fire, almonds, truer, through, them, Mile End, varnish, tiddle, Ptolemy. There was in this experiment, as can be seen, a tendency to run on the same first letter, or on others near it in the alphabet, which I now and then deliberately checked. In pronouncing, I made up in most cases a word suggested by the bare sound. There was no direct association between the words; they did not suggest each other, as is seen at a glance. (11) I build up the words and write them down, without interfering with, or being influenced by, the current of my thought.

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* Belief and possibility play a considerable part in current psychology. Bain, Brentano, Stout, and many others, speak at length on the subject; but they do not refer, so far as I can discover, to what actually takes place.

Association was need-determined or topical: I wished to utter syllables. If I so desired, I might shape intelligent terms of one, two, or more syllables; or syllables without meaning; or both classes combined; or words beginning with certain letters. I can also re-develop associated or connected words, such as house, window, room, steps; but even here the topic is "house," leaving aside the presence of a decision to persevere in a stated course. In the word series given I cannot suggest what ruled the nature and the order of the initial and other sounds.* (12) I will to move my hand to the right; then I will to move it to the left. In each case the act of willing is not willed. Will, then, does not explain itself; it itself develops out of a previous system. (13) Ordinarily I perform many actions. I pick up a chair and carry it across the room; I shut the note book, re-open it, and turn over its leaves till I come to a page I am looking for. Actions thus succeed each other, most of them organised, adapted and intelligent. I act readily because I have so often done the same or a similar thing before. (14) As a matter of information we say "yes" or "no." Or after weighing an argument, looking at a drawing, deliberating over an action, we say "yes" or "no" in answer to a question. We do not affirm or negative every statement which flits by. It is the same with the will (sec. 164). (15) When I say "I will," I generally refer to that portion of my thought or to those needs which most commonly rule the field of thought. I can consequently defeat myself, and then one need triumphs over another. The ruling need is identified with the self, and, being but one among many needs, can be put to flight. Evil thoughts may dominate us, and then we fight against virtuous inclinations. In those who are shallow, the "I" is repeatedly identified with opposite needs (sec. 163). (16) The incentives to action lie in our wants (sec. 156), which may be divided into the following classes:

(*a*) Perennial Needs: these are such as are essential to the organism; for example, solid and fluid nutriment, fresh air, rest, sleep, exercise, variety, warmth.

(*b*) Periodic Needs: these are such as distinguish the seven ages of man.

(*c*) Personal Needs: these are peculiar to the individual organism and supply us with our permanent individual character.

(*d*) Peculiar Needs: these result from our special environment.

(*e*) Political Needs: these are such as have reference to our social, national, racial and physical environment.

(*f*) Passing Needs: these are such as are casual and passing.

All systems are thus initiated and sustained by definite stimuli and functional tendencies on which they are dependent.

From the scientific standpoint there can be no justification for a chapter on the will; for if we admit the general fact of connected succession, the notion of an arbitrary will, as ordinarily understood, loses all reality. We are bound to assume, until the contrary is proved, that the facts in which we are interested are as strictly related as are those which form the subject-matter of physics. The previous portions of this treatise have uniformly referred to facts, and all that we have learnt has tended to exclude the notion of a power which is not identical with organic needs. The above abstract of a series of experiments points to the same conclusion; but we must nevertheless examine the subject of the will exhaustively, if only to attain to a knowledge of human limitations, and to broad negations of current views.

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* Parrots thus talk *unconnectedly*.

The question of free-will is one of those ghosts which are easy to raise and difficult to lay. It is like the strange being whom the knight, in Spenser's *Fairy Queen*, vainly tried to break, to strangle, to crush or to pierce; and who only yielded when held under water. Since dialectic methods have been unsuccessful in the past, I have applied above the ordeal by experimental introspection. Whether this attempt be successful or not, there should exist no doubt that the issue is amenable to such treatment.

The veteran psychologist, Wundt (*Grundriss*, 1896, p. 228), holds that theoretical interests are sure to falsify inner observation. This supposition of Wundt's brings out the lamentable fact that psychologists as a body make their profession subservient to other interests. Apart from such an explanation it is wholly inexplicable why there should be the slightest danger from the side of theoretical interests. Surely, eagerness for facts should outweigh tenfold the desire to verify some theory.

To return to our experiments. They make clear (1) that when we will movements, the movement to be willed is always suggested; (2) that series of willed movements, as well as single movements, have their character determined organically; (3) that word series are brought about by the same factors; (4) that needs initiate and maintain movement; (5) that ends or insistent volitions act within an organised system; that they cannot be thought of as acting otherwise; and that therefore the barriers between voluntary and involuntary activity are artificial; (6) that resolves are like a scaffolding which becomes useless when an activity is built up; (7) that deliberate volitions are rare; (8) that the act of will is itself suggested and usually unwilled; and (9) that our total activity is rigidly connected.

Further inquiries confirm this position. As I watch myself whilst active, I am perpetually surprised at the independent and intelligent way in which the different muscle systems perform their duties. I notice, for instance, a long succession of finger movements and tongue movements which seem to be as little connected with my general intentions as the behaviour of the clouds above me. I am, as it were, a spectator rather than an actor in what I do. It seems as if each muscle had a brain and a life apart from mine; as if I were their fellow, and not their master. Repeatedly I admire the readiness and resourcefulness of those actions. Now the more completely I accustom myself to observe while indifferently going through routine labours, and the more hours and weeks I am thus engaged, the more my wonder increases. Aims, referring to every step in an action, are here much restricted. Only when extra effort is required in re-development, or when an end has to be reached in an indirect and circuitous manner, can we speak of Will. As soon as confusion and effort disappear, so soon have we usually done with the Will. Only when we have to think out a problem, do we image at all what we are doing.

The place of the Will in the flux of thought can be determined experimentally in other ways. I can deliberately will to re-develop what is contiguous to, or resembles, some particular I am thinking of. The insistence is here the outcome of a need—*an insistent need*, in fact,—and the resulting success or failure is determined by factors with which we are now acquainted. However, more interesting tests are possible. [*Test what follows.*] (1) I can shut my eyes, *determine on nothing*, and watch the result. A noise, a bodily feeling or a recent event will then capture the field of attention. (2) I determine to think of *nothing*. The results resemble those just referred to. (3) I determine to think of *something*, never mind what. Still the same results. (4) Lastly, I determine to think of what is unlike something thought of. This is the most curious case. Usually the idea of the unlike becomes complicated with some oft re-developed fact, and this becomes more and more the case as I proceed. If I deliberately ignore these complications, the result is that I seem to hold things back, to inhibit something, and then, sometimes, the unlike system develops. In every instance of this nature verbal images must be discounted, for we have seen that their introduction destroys honest experiment. The liability, in the above experiments, to re-develop mechanically the same person or thing which we have previously re-developed on a similar occasion, is, as pointed out in sec. 89, so great that we exclude these contiguous occurrences in each case.

On experimental grounds our conclusion, therefore, is that *all* human activity is comprised in a rigidly interdependent system, antecedents and consequents belonging to an organised order. Human action is of one piece, and no part differs essentially from any other. It might perhaps be suggested that experiment is not necessarily borne out by non-experimental processes. To this the reply is that on carefully comparing both sets of processes, one finds that they agree in every detail (see chs. 4 and 8).

Against all the above will be brought "the testimony of consciousness." With that, as with any other mere opinion, we have nothing to do. Besides, persons who do not believe in introspection on the ground that it is fallacious, should be the last to fall back on such an argument. The student of psychology, as such, is only interested in the facts of psychology, and must determine these *honestly*. If after his investigations he feels compelled to take up an attitude for or against free-will, that is a non-psychological point. *To go to psychology and to force it to yield him what his philosophy favours, is to wreck and prostitute the science.* If psychology demands intellectual sacrifices, some readjustment of one's general views, that is only what every growing science has demanded, and what we should expect and welcome.*

153.—The Effect of Volitions.

Let us assume that the will possesses unrestricted power. In that case, I have only to decide to be wise in order to rank with Socrates, however deficient in intelligence I may previously have been. [*Examine these assumptions.*] This is absurd on the face of it compared with what volitions ordinarily accomplish. Assume, again, that I determine to become wise without delay. My determination is unavailing, for willing as such is no determinant. Assume once more that I will to be wise; but this time we will suppose a normal case, and also that I am intelligently guided by a knowledge of my capacities. In this instance my determination is the outcome of a deep-seated need, so strong that most other needs are subordinated to it. My decision focuses a tendency which has slowly grown and struggled into supremacy. A firmly rooted need being present, I necessarily devise measures for its satisfaction; and if I boast of but a spark of insight into human nature, I shall not attempt to become wiser than my antecedents warrant. The flowers of wisdom can only be plucked by those who have sought them in youth; the uneducated adult searches for them in vain. The will to be wise has no tangible effect unless a person has limbs supple enough to climb the hills of learning, and we, therefore, assume that in the above case, this indispensable condition is complied with.

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* In this connection, see Travis, *An Introspective Investigation*, 1877. Compare also sec. 186.

Our organised reactions, when we are wanting in intelligence, are disjointed, narrow in scope and ineffective, instead of being connected, wide in scope and effective. To grow intellectually, we must remove the former condition, and strive to establish the latter. This is, however, a difficult task, and a life-time of earnest labour is, therefore, scarcely sufficient for its accomplishment. It implies constant study, and the determination to profit by every favourable opportunity; it excludes all relaxation of effort. In this manner, stimulated and sustained by a ruling inclination, we are gradually changed, and our reactions come to be more and more in harmony with our conception of the wise man.

The stuff we are made of tells in every direction. If we are cast in a certain mould, our determination will soon be dead and forgotten; if in another, we shall toil and moil, and make but little headway; if in a third, we shall now lose heart, and now wax enthusiastic, with results, naturally, of no great value. [*What class of mind is yours?*] The singleness, the purity and the earnestness of the desire, are only a few out of many relevant factors.

The normal effect of our volitions is determined organically. Taught by the course of events, we usually know what we can do, and we do not attempt what we know is beyond us. For example, most men would decline to join an expedition to the North Pole, knowing that they are not fitted to undergo the necessary hardships; but they will agree to a proposal which they know falls within their range. If they are mathematicans, they "intend" their minds without ado on some intricate problem, and solve it; if they are altogether unacquainted with mathematics, they wisely refrain from the attempt. Willing in itself, other things being equal, can do nothing; and in what we do, or determine to do, we merely realise the pressing needs of the moment in the manner explained in ch. 4. Were our organism differently constituted, we might, on the one hand, find the field within which our desires at present move greatly restricted, or, on the other, possessing an immensely wider scope.

154.—WILL AS ABSOLUTE.

We saw (sec. 152) that it is possible to call spirits from the vasty deep. There need be no half-heartedness about such willing, and it may proceed exactly as if we were willing what was possible. Possibility and impossibility, belief and unbelief, are beside the question. Will the spirits, however, come? The facts answer, "No."* There are, then, bounds to what we can do. Where are these to be found? The answer is obvious. The possibilities of the organism limit our will. Were there no nerves proceeding from the brain to the fingers, we might helplessly will to the crack of doom that our hands should open and close.

The following is an approximately correct account of actual willing. [*Test this.*] Some need, as represented by a central nervous stimulus and a simple feeling, seeks for satisfaction. There results then, for instance, a tune played on the piano, the stimulus provoking topical nervous activity of an acquired kind, which we recognise in the regulated movement of the fingers. All the interactions—the touches, sounds, etc.—play, of course, their part, while the initial willing and the various steps of the total process are, on the whole, organised. *Should the task be a difficult one, there is no essential difference,* as we saw in sec. 65; *we encounter only more steps of the same nature.*

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* See, however, sec. 232.

Chs. 3 and 4 have shown that, at bottom, all activity is organised. Especially in sec. 96 we saw that the same systems form an important constituent in all action. In normal activity, therefore, the willing, as well as the various steps in execution thereof, will pass almost as mechanically and smoothly as a gently flowing stream. We generally exhibit, therefore, a minimum of marked aim and foresight.

The above considerations are of some importance when we wish to introduce changes in the economy of thought, for they teach us that it is worse than useless to make sweeping demands on any individual. We must, on the contrary, study capacity and educability, and then elaborate educational measures in agreement with conditions existing in each case. The attempt to force men into adopting an unwelcome line of action by telling them that they need only try, has, as a rule, results of less than doubtful value. [*What effect has such a method on you?*]

We see how the will is circumscribed. On the one hand, the particular organism has its rigid limitations, and, on the other, achievement in new fields necessitates a protracted process, since the central nervous system is irritatingly slow in adapting itself to changed or new needs. At the same time, *willing merely expresses the fact of the existence of a need pressing for satisfaction.* With hypothetical creatures, who are freed from the trammels of a central nervous system, this may be different. Possibly nothing raises difficulties with them. They perhaps have only to wish to be wise or foolish, and, as with a conjuror, the feat is accomplished. I say "perhaps" and "possibly," for I have no psychological notion of such creatures. I only urge that it is mischievous, both psychologically and ethically, to assume that human creatures are in possession of a faculty superior to that which we know may be assigned to the brain. The sooner this is admitted, the sooner shall we see an advance in both theoretical and practical psychology. Ignorance, in this instance, is a curse and not a blessing.

The following are some of the opinions held by psychologists on the nature of the Will. Bain (*Senses and Intellect*, 1894, p. 2) speaks of "Volition, or the Will, embracing the whole of our activity as directed by our feelings;" and in another place (*The Emotions and the Will*, 1875, p. 354) he writes: "Without some antecedent of pleasurable, or painful, feeling—actual or ideal, primary or derivative—the will cannot be stimulated." Bain exempts from the sway of the will, neutral excitement, spontaneity when due to recency, fixed or ideo-motor ideas; and of emotions he says in this connection: "An emotion persists in the mind and dominates the course of the thoughts, not because it is pleasurable or painful, but because it is strong" (*ibid*, p. 381). Baldwin (*Feeling and*

Will, 1891), with many psychologists, holds that the idea of a movement is itself a nascent movement, spontaneously leading to the movement proper. He says on this point: "Every state of consciousness tends to realize itself in an appropriate muscular movement" (p. 281). He sums up our problem as follows: "In all cases of intended bodily movement there is, first, a reason why we will the reaction ; second, the actual decision or act of will; and third, the resulting movement" (p. 316). Bradley, *Appearance and Reality*, 1897, p. 115: "In volition we have an idea, determining change in the self, and so producing its own realisation." Chmielowski, *Entstehung des Willens*, 1874: "All human actions may in the last resort be considered as simple muscular movements, which, in their turn, consist of muscular contractions" (p. 5). "Stimuli excite our motor-nerves, and these give rise to muscle-movements" (p. 29). In willing, "the ideas must appear in their objective aspect of pleasurable or painful" (p. 70). "The second special mark of an act of will is the actual possibility of carrying out the necessary movements" (p. 71). Féré, *Sensation et Mouvement*, 1887, p. 16: "The idea of a movement is the movement already begun." Hamilton, *Metaphysics*, ii, 1877, p. 433: "Conation is a longing,—a striving, either to maintain the continuance of the present state, or to exchange it for another. Thus, conation is not the feeling of pleasure and pain, but the power of overt activity, which pain and pleasure set in motion." Herbart (*Psychologie*, 1824, ii, p. 70) says that "Feeling, willing, desiring, are abstractions." Hodgson, *Metaphysic of Experience*, 1898, iii, p. 165: "Volition . . . . is a process of conscious choice, a process of comparison and deliberation followed by a decision." Hoffding, *Psychology*, 1891: "Volition proper is characterised psychologically by the ideas of the end of the action and the means to its realisation, and by a vivid feeling of the worth of that end" (p. 313). "Merely the fact that a feeling has once found a vent or discharge in a certain way, may be of decisive import for the manner of its later expression; it may have either an inhibitive, a strengthening, or a transforming effect" (p. 346). James, *Psychology*, 1890, ii: "When a particular movement, having once occurred in a random, reflex, or involuntary, way [in this James follows Bain] has left an image of itself in the memory, then the movement can be desired again, proposed as an end, and deliberately willed" (p. 487). James' criticism of the theory of innervation will be found on pp. 493 ff. "An anticipatory image of the sensorial consequences of a movement, plus (on certain occasions) the fiat that these consequences shall become actual, is the only psychic state which introspection lets us discern as the forerunner of our volitional acts" (p. 501). "Every representation of a movement awakens in some degree the actual movement which is its object; and awakens it in a maximum degree whenever it is not kept from so doing by an antagonistic representation present simultaneously to the mind" (p. 526). Jodl, *Lehrbuch*, 1896, p. 427: "Every voluntary movement is characterised by this that it is guided by an image of that which is to be done." Ladd, *Psychology*, 1894: "We never know nor feel, that we do not also will. Conation (or volition) enters into all perception, memory, imagination, thought" (p. 212). "Conscious striving enters into all the most primary psychical states" (p. 219). Lipps (*Grundtatsachen*, 1883, p. 63) holds that will and pleasure-pain are the soul's ornaments, and that they have no power in themselves. James Mill, *Analysis*, 1869, ii: "We have now established, by an ample induction, that the action of muscles follows, as an effect its cause ; first, upon sensations ; secondly, upon ideas" (p. 348). Here Mill argues that since he has shown (mistakenly) that every movement is preceded by a sensation, therefore that sensation is the cause of the movement. The father stood evidently in need of his son's *Logic* (sec. 96). "Our power of willing consists in the power of calling into existence the appropriate idea ; . . . . the power of the will is not immediate over the muscle, but over the idea" (p. 348). "There appears no circumstance by which the cases called voluntary are distinguished from the involuntary, except that in the voluntary there exists a desire" (p. 350). "If . . . the idea of the outward appearance of the action calls up . . . . . the idea of the internal feelings of the action, ... we are said to will" (p. 354). In other words, when we paint the action in the imagination, no movements follow ; but when we become absorbed in the feelings connected with the action,—when the need flows into a muscular channel,—then the movements do follow. *This sentence of Mill's embodies probably the closest analysis we have of the last step in the volitional process.* "We cannot will without willing something; and in willing we must have an idea of the thing willed" (p. 358). I give in full the summing-up of his analysis. "In regard, then, to that state of mind which precedes action, we seem to have ascertained the following indisputable facts: That actions are, in some instances, preceded by mere sensations; that, in other instances, they are preceded by ideas; that, in all cases in which the action is said to be willed, it is desired, as a means to an end; or, in more accurate language, is associated as cause, with pleasure as effect; that the idea of the outward appearance of the action, thus excited by association, excites, in the same way, the idea of the internal feelings, which are the immediate antecedent of the action, and then the action takes place: that whatever power we may possess over the actions of our muscles, must be derived from our power over our associations, and that this power over our associations, when fully analysed, means nothing more than the power of certain interesting ideas, originating in interesting sensations, and formed into strength by association" (pp. 378-9). Münsterberg, *Die Willenshandlung*, 1888: "The will is a complex of sensations" (p. 62). "The essential in volition is the feeling of inner activity" (p. 62). As to the everlasting innervation controversy, see p. 76 of his interesting book. Rieger, *Die Willensthätigkeit*, 1885, is a restricted experimental study of control over movement. Robertson, *Psychology*, 1896: "When I say, I will to open that door, I am representing to myself the door as opened, through muscular acts of mine, for some end or purpose in consciousness" (p. 219). Again, "Directly or indirectly, nearly or remotely, you will always find an element of feeling involved in conation, together with intellection and representation" (p. 220). Schneider, *Der menschliche Wille*, 1882, p. 289: "The act of choice produces the subordination of special, proximate, and direct aims, to an aim which is more general, more remote, and more indirect." Spencer, *Psychology*, 1890, i: "In a voluntary act of the simplest kind, we can find nothing beyond a mental representation of the act, followed by a performance of it" (p. 497). "An involuntary movement . . . . occurs without previous consciousness of the movement to be made" (p. 497). Stout, *Psychology*, 1896, i: "The mental attitude of voluntary decision is distinguished and characterised by the dependence of the act on the belief that we are going to perform it" (p. 132). "Mental activity exists in being felt. It is an immediate experience. The stream of consciousness feels its own current" (p. 160). "The process of conation is, as such, a *felt* process" (p. 166). Sully, *Human Mind*, 1892, ii: "It seems best, on the whole, to make the terms conation, volition, comprehensive enough to include all actions which have a conscious accompaniment, and which we will henceforth mark off as psychical actions" (pp. 172-3). "The most obvious general differentiating circumstance in all conative phenomena is the presence of the psychical correlative of muscular action" (p. 173). "A second main differentiating ingredient in the conative process is consciousness of purpose, or forecasting of an end" (p. 175). "The prompting forces in our voluntary action are feelings. We exert ourselves for the sake of some future gratification of feeling, as pride or love" (p. 2). "Thought . . . is characterised by a more or less prolonged state of muscular tension, involving a balancing action of the antagonist muscles" (p. 179). Here is a description of an act of will, which ignores the fact of economisation: "The child has tasted an orange. You offer him another, and he puts out his hand and takes it. The psychical event in this case seems to consist of the following stages. The complex of visual sensations supplied by the orange suggests, according to the law of contiguous association, the representation of the taste and the pleasure accompanying this. This representation of a pleasurable experience closely connected in time with an actual presentation excites the state of desire. That is, the child craves a renewed enjoyment of the orange-sucking. The idea of the succulent pleasure-giving orange, fixed and sustained in the state of desire, suggests in its turn (also by associative reproduction) a particular action or series of movements by means of which the pleasure may be realised" (pp. 195-6). "As soon as a desire prompts us with sufficient intensity or strength and a suitable action is suggested with the requisite distinctness and stability, the actual performance follows, provided that there is nothing to counteract this prompting" (p. 211). Thompson, *System of Psychology*, 1884, i, p. 96: "Volitions . . . . never occur independently of feelings but in connection with them and stimulated by them." Ward, *Psychology*, 1886: "We can by what is strangely like a concentration of attention convert the idea of a movement into the fact" (p. 42, col. 2). "Change of sensation is followed by change of movement, the link between the two being a change of feeling" (p. 43, col. 2). "This change of movement through feeling" is "brought about . . . . by a change of attention" (p. 43, col. 2). Wundt, *Grundriss*, 1896, p. 221: "When an evident struggle between opposed motives precedes an action, we name the act of will an act of choice, and the process which precedes it, a process of choice."

Reviewing the above, one feels constrained to believe that our present-day psychological achievements in the department of the Will are far from satisfactory. The most prevalent notion seems to be that the idea of a movement fatally brings on the movement, if there is no obstacle in the way; that given the unopposed idea, the action follows. James Mill alone seems to have recognised the fact that action only tends to follow ideas of action under special circumstances, namely when the need flows along muscular channels. The illustrations to be found in Bain, Carpenter, and others, are not typical. It must be clear that as far as I am a visual, there is in me no tendency to write the letters I imagine; only as a motile, will there be such a tendency. Yet even here the nature of the stimulus or need determines whether and to what extent there shall be mimic or real movements. Finally, an idea of some change may exist in perfection, while no other opposing idea is traceable, and yet no action need ensue. [*Test.*]

155.—UNIQUENESS IN WILLING.

If the will were unique, the volitional problems we are here concerned with would be unique also. On the one side, the will, like a freely moving body, would appear to us dissociated from surrounding objects; on the other, we should encounter its unmistakable effects. This is not so in reality.

There are degrees of willing as there are degrees of feeling. We hint that we intend to do a certain thing, or we dwell repeatedly or continuously on the intended act. We also know that often nothing but strenuous and reiterated willing enables us to carry out a design, while events have taught us that we must often lose ourselves in an aim, if we are to compass it. Thus the more we possess the power of identifying our whole bent for the time being with what we desire to realise, the more likely is it that we shall be successful. If, however, we cannot collect or concentrate our thoughts,—if they disperse as soon as they meet,—we may as well not will, for assuredly we shall be disappointed. A man, for instance, habitually dismisses thoughts of duty until no yearning, however genuine, is competent to raise them for more than a moment. Here there may be keen willing with little effect to correspond. The simple act of willing is not sufficient: we must will continuously, repeatedly and arduously. [*Observe and describe such experimental happenings.*] On the theory which represents the will to be a unique capacity, this is embarrassing. At what point shall we be said genuinely to will? How long and how often must we dwell on a task which we wish to perform? What is to be the extent of the concentration of our forces? The lessons we have learnt, supply answers to these questions: a host of factors determine the will. Perhaps we are constitutionally weak or strong; perhaps education has lowered or raised the will-value; or perhaps circumstances have encouraged either ill-directed or well-directed activity. The will or the insistence will be strenuous in agreement with the stage of neural development.

As with strenuousness, so with purity. Theoretically, on the spiritualistic hypothesis, the presence of the will should be obvious; but in practice, the contrary is true. We find there no harmonious assertion of self, no evident feeling to which we can point as representing the will. Owing to the organised nature of human activity such a thing is impossible. The strength and purity vary indefinitely: we can imagine a firmer self-assertion and a deeper conviction, and we can imagine a laxer determination and a shallower devotion.* Unless our analyses are fundamentally erroneous, this could not be otherwise, for both the self-assertion and the feeling are organised. Hasty observers choose indeed pronounced examples; but even these examples yield nothing but vague feelings which are freely misinterpreted.

A distinct appreciation of what constitutes the volitional feelings has not tempted us to regard the will as a special and unique faculty. When we consider clearness of aim, we reach the same conclusion. At best, the clearest aim, like a changing cloud, offers but an imperfect outline [*is that so with you? test it*], and must be thought of organically. Let my aim be to hit the wicket with the cricket ball. Owing to the organisation of thought, I but re-develop what is essential. My turn comes to bowl. I step a few paces backwards, and moving forwards, I let the ball go in the required direction and in the customary way. To have in view the whole of the actions is impossible, for most of them are not yet disclosed by science, and the remainder which are known to us, are nearly all absent from the memory. The clothing of our aim in words does not help us, unless we assume that language has some magic power. Must I clearly image what is exactly conveyed by the words "hit," "wicket" and "cricket ball"? Is my notion of these words not organised? Or what do I picture when I employ them? It is, therefore, plain that whether we are dealing with organised feelings solely, or whether we think of our object in words, or pictorially, the aim must still be organically conceived. Language assists us in conveying information to others by means of hints rather than in formulating concrete aims. To identify the will, therefore, with the presence of an aim is to leave the issue untouched. Let any one who does not play cricket, aim at "hitting the wicket with the cricket ball." Would his notion of what he was attempting be clearer than that of the cricketer spoken of who can accomplish it? Indeed, if we assume that the non-player draws on no organised reserves, the whole aim becomes meaningless. No fine distinction can be made between activities, and a non-organised notion is, therefore, impossible. The expert visualiser imagines the wicket down; the audile hears the ball whizzing; the word-spinner constructs a neat sentence; but these things are not of the substance. Need-stimulated and organised reaction alone account for the intelligent act.

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* "Those lines that I before have writ do lie,
Even those that said I could not love you dearer;
Yet then my judgment knew no reason why
My most full flame should afterwards burn clearer."
Shakespeare, Sonnet 115.

See an analysis of cricket from the psychological standpoint in Sully, *Human Mind*, 1892, ii, pp. 209-10. Stout (*Psychology*, 1896, i, p. 167) says: "It belongs to the essence of will not merely to be directed towards an end, but ideally to anticipate this end, and consciously aim at it." My contention is that, in the sense that I have defined it above, all action is of such a character, and that vividness of imagination is no guide to the presence of will.

We have noticed in our experiments that volitions are possible only within the limits of organised reaction. Strictly speaking, we identify the willing with the emergence and pushfulness of a need. If the want is easily satisfied, as in playing a well known air, the fingers glide nimbly and intelligently across the keys. When we willed the tune, we did not will every movement connected therewith, for there was no necessity for that. When, however, we were attempting to play the air for the first time, each step had to be willed and re-developed in the fashion already described. In fact, neither general nor special volitions exist for psychology, except in the organised manner indicated.

It used to be held that in moving parts of the body we could feel the energy that we were putting forth. These feelings were spoken of as innervation feelings. Gradually, however, the opinion became prevalent that these so-called innervation feelings, instead of being central feelings, were the feelings which resulted from the muscular movements themselves, that is to say, that they were afferent and not central; they followed the action instead of preceding it. The controversy has now reached the stage of compromise. Observation and experiment with young children and adults have shown that movements never before made cannot be willed, *e.g.*, a little girl of fifteen months, ineffectively tries to imitate a series of sounds or movements which I make. It is, therefore, plausibly contended that the motor feelings which developed on making a certain movement for the first time,—the kinæsthetic equivalents,—are re-developed whenever we will some movement, and that these equivalents correspond to the feeling of innervation and precede the muscular sensations due to the act. On this theory, the immediate antecedent of the action would not be and could not be a visual or audile image, but a re-developed muscular feeling. It remains now to be seen whether such feelings are traceable, or whether there are not other factors which have to be considered. It seems to me unlikely that these equivalents should invariably precede muscular activity.

156.—VOLUNTARY, NON-VOLUNTARY AND INVOLUNTARY ACTIVITY.

It is customary to divide actions into conscious and sub-conscious, or habitual and reflective. We have seen, however, that this difference cannot be upheld. *The subtle thinker, drawing out a fine thread of thought, exemplifies as much organised reaction as the professional who for the hundredth time accompanies a sentimental song.* Actions must, therefore, be classed as habitual or, as I prefer to name them, organised; but if this be so, what becomes of the distinction between voluntary and non-voluntary? The answer is that either all actions belong to the one group or to the other. If the term voluntary is taken absolutely, then either we deliberately will every single motion or idea, or we never deliberately will at all. There is no halting between these two views.

Is, then, every action voluntary? If so, what is meant by voluntary? Absent-mindedly I look into my plate, choose a plump cherry, pick it up, and eat it. [*Describe such an instance fully.*] Is this a voluntary act? All the while I have been thinking about the peculiarities of the English climate, and not a word has escaped me about the fruit. Having eaten cherries and other fruits many times previously, there is no need to reflect. Suppose I had stopped and said, "my aim is to eat a cherry;" how far would that have altered the situation? We should still, I hold, be facing an organised reaction, only one of a slightly different complexion. It is by virtue of organised thought that such a sentence comes into being at all (sec. 215). For practical purposes we may assert a difference between deliberate and non-deliberate willing; but only for those purposes. Theoretically both classes of willing must be regarded as one. A need initiated and determined both courses of action.

James (*Psychology*, 1890, ii, pp. 522-3) says: "I sit at table after dinner and find myself from time to time taking nuts or raisins out of the dish and eating them. My dinner properly is over, and in the heat of the conversation I am hardly aware of what I do, but the perception of the fruit and the fleeting notion that I may eat it seem fatally to bring the act about. There is certainly no express fiat here." According to the view in the text there is purely a question of degree between James' "fleeting notion" and his "express fiat."

If we examine the reason why persons will as they do, we detect further proof of the truth of our contention. [*Add, if possible to the following list, and expand the text.*] (1) The first group of needs we have named *Perennial.* Let us illustrate this class. I am hungry, and decide to take some food; I deliberately make arrangements accordingly. Perennial needs are thus the spring of much of our activity. A large portion of our time is spent in procuring the means to their satisfaction. Our acts are determined by certain definite functional tendencies. (2) *Periodic* needs form the second group. The child is bent on playing with the sand; the youth dreams of fair women; the man schemes how to carry through some enterprise; and he who is bowed down with age delights in calling up the past. These various stages of man's life have little sympathy with each other. What should we think of any two of these classes exchanging parts, the youth fond of a toy, and the child of three years of age stirred by the thought of a fair face? The physical cycle which constitutes our existence from birth to ripeness and decay is accompanied, as we should expect, by a psychic cycle, and most of our willing is directed towards doing justice to the changing needs of our nature. It is not by accident that the child loves play, the youth thinks of the future, the man revels in the present, and the aged in the past. Their physical development prescribes or indicates the paths which they so readily find to their taste. The functional tendencies are shadowed by a retinue of feelings, interpreted as desires, which serve the great purposes of life. (3) *Personal* needs are such as specially characterise the individual. One person has nerves of steel; another is hyper-sensitive: the former is boisterous, daring, fond of adventure; the latter shrinks from human contact, loves quietude, and breaks down speedily. Again, one man has an excellent ear for music, while another entirely lacks the musical sense; the former revels in things which the other does not appreciate at all. Once more, one man has a powerful intellect and delights in untying stubborn knots, while the other, feeble intellectually, avoids everything which presents intellectual difficulties. So also differences of sex form a dividing line. Individual peculiarities account in this manner for another portion of what we detest or what we rejoice in. (4) Take, again, *Peculiar* needs. Civilised society is broken up into layers, and to these layers correspond certain needs. Let us watch for a day a costermonger, an individual belonging to the middle class, and a man of wealth and culture, and striking contrasts will be noticeable which cannot be accounted for by individual aptitudes. As we shall see in ch. 9, the social pressure of any section of society is so great and constant, and men are so elastic in their constitution, that the average individual bears the impress of his class. Accordingly, the three fundamental needs will be interpreted by a class-code and by environmental influences generally, and hence the desires of any person must be considered in that special light. (5) *Political* needs, or needs of space and time, form the fifth class. The ways of a nation change with the times. An average Englishman of to-day shows, therefore, peculiarities of his own when compared with one who lived eight hundred years ago. In the same manner, race, climate, soil, and other circumstances determine our actions or modify the will.

The above, including *Passing* needs, are the forces which move us, determine our conduct, and produce the strange panorama of human life.*

Strenuous willing is not necessarily connected with a condition of awareness or deliberation, and hence when we are engrossed in our daily occupation and when we seem furthest removed from a state of deliberation, it is no uncommon event for others to notice how we pause, reflect, stare and knit our brows. There are indeed so many stages in willing that it is impossible to separate strenuous activity from highly organised activity by the intervention of a deliberative act. [*Illustrate this experimentally.*] On the contrary, deliberate action is often extremely easy, while some classes of routine work, such as that of the ledger clerk, are exhausting.

When an activity has become more than usually organised, we not seldom observe a curious freak: we do that which we are anxious not to do. We have, we may suppose, come to consider a certain line of thought as fraught with danger. We decide not to pursue it, since it imperils our honour and our peace. Yet, in spite of this, on account of organised reaction, the thoughts present themselves again and again. We will deliberately that which we deliberately willed not to will, and on the ground of organised reaction this is what we expect, contradictory needs producing contradictory thoughts. In this way, many men live to a large extent a double life: they profess devotion to an ideal, and act in opposition to its dictates. With them the better part is organically the weaker. On the other hand, the better part of us may be triumphant in action, while fierce struggles still proceed within. Deliberateness is not necessarily connected with one all-powerful notion; a jungle-full of beasts may dwell in us and each rule in its turn.

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* On needs, see Paulhan, *L'Activité Mentale*, 1889, pp. 199-209.

This brings us to involuntary activity. We often speak of doing things involuntarily. A child, for instance, has to choose one fine morning between going to school and severe punishment. He agrees to the former, and marches to school "against his will." Had he, however, been left to decide for himself, he would have selected the meadows. It is obvious, nevertheless, that the child has willed to join his school-fellows, for no one carried him to school, and yet he was not absent. He distinctly decided that he would be at his desk, and went accordingly. Hence, after all, he did not go "against his will." What we mean is that, like a man who "forces" himself to act rightly, he went because of extraneous pressure, and not because he relished the notion of school. He "willed" the action as much as he would have "willed" the game among the sweet-scented hay. Thus, physical force apart, there is no involuntary activity. Only when we are taken along bodily can we be said to have moved without "willing."

In the Introduction (sec. 10) I offered the following definition of psychology: Psychology treats of the nature and satisfaction of those distinctive needs which are connected with the central nervous system, and this it treats of in systematic conjunction with the systems of sights, sounds, smells, etc., which are developing concurrently, *i.e.*, psychology treats of the needs which arise out of the relations of the various systems in the organism, and out of the relation of that organism to its environment." In other words, psychology is the science of central needs. The question now presents itself as to what is exactly meant by needs and central needs. Here is the most precise explanation I can offer.

Some of the functions of the human organism are delegated to special systems. Thus the heart, the lungs, the stomach, the kidneys, the bowels, the secreting glands, play each an essential and separate part in the life of the body. These systems, by the nature of their structure, have each assigned to them a particular task. This is evident when we compare such systems as the stomach, the heart and the lungs, and observe how widely they differ from one another. Each of them is primarily of an active nature. The stomach digests food, the heart propels the blood, the lungs look to the air supply, and when the functions proper to them are endangered, they cause widespread disorders. These systems are of an unstable character, and freely respond to certain stimuli. When, for instance, the stomach is filled, it readily and in its own manner elaborates the food which is carried to it. For this purpose it possesses a complex mechanism which is itself a product of natural selection, slightly transformed by its environment. From the standpoint of its normal functioning, we speak then of alimentary needs; and these would include the needs of its smallest portions. These needs stimulate the alimentary system; they are functional tendencies. However, as we are aware, the stomach has no independent existence. It supplies other systems, and is supported by them. Its life is a social life, the total organism being the body corporal. The stomach, for example, cannot procure its own food. That is obtained by other systems. Thus absence of food initiates a set of processes, mediated by nerves and muscles, which end in satisfying the stomach. The central nervous mechanism is the great mediating system. It harmonises the various functions; it elaborates methods of defence and offence as against the environment surrounding the body; and it stimulates various systems, the end of the stimulation being the intelligent locomotion of the body and its parts. The structure of the central nervous mechanism, like that of the stomach, is an outcome of the ages, and only secondarily transformed by environmental influences. It is a part of the body of which it forms an integral portion. It is influenced by other systems, and influences them in its turn. When I speak, therefore, of central needs, I mean the functional tendencies inherent in the central system under the particular conditions of any moment, and I DO NOT MEAN THAT WE ARE NECESSARILY CONSCIOUS OF THOSE TENDENCIES OR THEIR SATISFACTION. Thus the empty stomach affects the central mechanism, and sets it going, the active tendency forming the central need, and the effectiveness of its structure determining the particular lines of action.

We have so far described what we mean by a need and a central need. What, however, are the precise features of needs of which the psychologist must take account? Speaking quite strictly, it is probable that no delimitation is possible. However, if we abandon this extreme position, we reach the following result. A complete psychology would, for instance, tell us what is the effect of an empty stomach on the nervous system and proceed to enumerate the physiological changes which supervene until the requisite food reaches the stomach. Some of these changes would be represented by feelings, sensations and ideas; but the overwhelming majority of them would not be shadowed by any feelings which were directly observable. Thus one department of psychology would trace the physiological processes connected with central needs, while another would deal with the accompanying facts of feeling.

Psychology treats accordingly of intelligent activity, and is not in any way bound to those non-bodily aspects which mark that kind of activity. Nevertheless, in the present state of knowledge, it is our duty to examine minutely the constitution of the unexhausted primary and secondary worlds, in order to obtain hints concerning the more enlightening neural facts. On the physical side, we can at present only make use of data of a general nature such as are the common property of physiologists and physicists. The more intimate neural processes we will not even guess at, since that would be following in the wake of those who go beyond "the fringe which borders our knowledge." For ultimate and measurable psychological facts we must look to future developments of the science.

A need might be defined as a condition where there is absence of equilibration, as in a curled and moistened string, or a descending rivulet faced by a stone, or a tissue which is breaking up, or a feeling which persists until certain changes have taken place (sec. 250). In the animal body the nature of this condition and the mode of its removal are chiefly controlled by hereditary tendencies. A need thus defined implies the presence of a tendency; *it does not necessarily imply our awareness of that tendency.*

157.—Depreciating and Appreciating the Will-Value.

All activity is the outcome of organised growth, and the way in which systems develop is, therefore, determined by the manner of their previous development. We cannot, accordingly, always react as the fancy of the moment suggests, and sudden reform, except in minutiae, is, consequently, out of the question (sec. 60). Let us consider a few of the notions which favour a low will-value.

Some people hesitate when they ought to act with decision. Is it wrong to do this or that? they ask, and then they inconclusively debate the *pros* and *cons*. In this manner, whenever a point arises which requires to be settled, it is left undecided because of their pendulum-like incapacity to bring an argument to a conclusion. At first, these mute discussions are merely a plausible pretext for following their own bent. As time goes on, an irresistible inclination develops, until at last these men find that they have acquired an objectionable habit which it is beyond their power to reform, though their whole individuality is at stake. Others choose the line of least resistance by pretending that they cannot decide between rival claims. "You say so-and-so, some one else says something different; one is as likely to be in the right as the other." They, therefore, cease to judge any case on its merits. "Perhaps after all, this course which looks desperately ugly, may be the right one," reasons another set of persons. "Considering the circumstances, I am bound to do it," argues a fourth class of individuals. When such hesitancy has become the ruling trend, pertinent judgments become rare. When a duty is in question, such men persuade themselves that there is no immediate necessity for consideration. When strenuous thinking is required, they feel convinced that the subject is unmanageable. Resolve occasionally as they may, such persons lose all intelligent control over themselves. Their will becomes a cypher. They are governed by irrational organised inclinations (sec. 146).

Many persons are unimaginative. They are not aware of the drift of what they are doing, and whatever course of action suggests itself, is, therefore, carried out unhesitatingly. Nor do they look before they leap. When anything new is to be attempted, they do not feel equal to it, and whatever they have been accustomed to, they consider to be right. Under such unfavourable circumstances the organism is not trained to sustained and subtle efforts, and is, in consequence, incapable of them.

Unpleasant issues are not attractive to face, and hence we soon acquire the capacity of dismissing every uncongenial topic. In the case of what is vitally objectionable, such a power is of immense advantage and is normally exercised by all men. When, however, every difficulty is thus evaded, the will-value dwindles almost to nothing. Deprived of vigorous exercise, new notions lack every vestige of control over old ones. We gradually come to do only what we are bound to do, and our character deteriorates completely. When this enervating attitude is general and continues for a considerable time, there is no moral hope for the afflicted invalid.

Passion and desire possess to a large extent the power just referred to. They are, when ignoble, the master-forces which mutilate character. When under their influence, men, instead of judging of an action dispassionately, lose the sense of proportion; they magnify trifles, and reduce oceans to pools. Under these conditions unlawful desires wear the white garb of innocence, while what is opposed to them looks black and ugly. Yet the game of life cannot be successfully played in this fashion, for only large aims, fearlessly conceived, can prevent disaster. Impulses, therefore, when unrestrained by, or not representing, general considerations, depreciate the will-currency; and hence desires, when they come to rule the actions of civilised beings independently of a comprehensive aim, are degrading and debasing. *What is done once or twice is but a feeble precedent which we need not follow; but the wise or foolish suggestion which is repeatedly acted upon becomes a compelling power which cares for neither Yea nor Nay.*

The unproductive treadmill does not inspire the prisoner with love for labour, and, similarly, all unsuccessful efforts damp our ardour. Unless action, therefore, be intelligently guided, we are sure to feel our tasks weigh heavily upon us, even when we are not incapable of performing them. Where a thing, then, is easily accomplished, objections are, as a matter of fact, seldom raised. Other things being equal, let men be trained to readily grasp and solve problems of a practical or a theoretical character, and they will not be likely to ignore them or to misinterpret them. Training is requisite in everything. Only experts in reading riddles enjoy solving them.

In training regard must be paid to the physical organism, for otherwise there will be a lack of completeness in our attempted explanation of the facts of life. To illustrate this, let us suppose that I am trying to discover what moved me to go out motoring yesterday in the rain. I spend an hour over the problem, but about fifty minutes out of the sixty are wasted. Scores of times I determine to think of my subject; but in vain. [*Does this ever happen to you?*] Here the plain fact is that my volitions are not always followed by the act to which they refer. Now if we probe this problem deeper, we come to the conclusion that there is no reason, apart from what the brain teaches us, why volitions should ever be connected with satisfactory results, or why they should not be altogether ineffectual. On the same grounds, except for the fact of excitement, it becomes inexplicable that I should recur so often to the subject. Furthermore, each resolve arises, not spontaneously, but as an item in an organised series.

I have so far dwelt on certain types of conduct which depreciate the will-currency. Little need be said in this place as to the methods of appreciating that currency. The question being an organic one, it follows that exhortation, persuasion and reproof must normally act as irritants alone; for *particular actions are most generally a sign of particular habits.* The only rational course is to begin training early, continue it uninterruptedly and intelligently for many years, and provide it with a broad foundation and with reasonable opportunities. The educator's first object, therefore, must be to raise the *normal* tone of *daily* thought and action to a higher level by instilling into men a passion for the right and the true.

The training of the will should, accordingly, have for its object [*notice this sentence very carefully*] our doing what is right and reasonable, or our searching for the truth, *unhesitatingly, intelligently, thoroughly, cheerfully and zealously.* When we once come to act from the broadest general principles, most of our difficulties vanish. It is only when we try to combat every ill with a separate remedy that we morally sicken and eventually succumb.*

What is right, what is true and what is beautiful, should each be established independently, and be only compared afterwards. The love of right, truth and beauty, should be uninfluenced by the others if an ethical, a scientific or an aesthetic decision is to be arrived at. Many, if not most, erroneous conclusions are due to the neglect of this rule.

158.—DELIBERATION.

Deliberation is to action in general what formal reasoning or interconnecting is to need-determined thought in particular. As in the latter instance we do not indulge in syllogisms whenever some issue is to be cleared up (ch. 4), so in the former we deliberate seldom and as to few things. Organised reaction determines that of itself. The necessity of working out afresh every problem which meets us scores of times within a single day would indicate a serious flaw in the neural economy. Most questions, too, as we have seen throughout ch. 4, are so intimately related to others that the freshest of them are, on the whole, familiar. The consequence is that lengthy deliberation is only casually required. It is, therefore, a matter of course that willing proceeds generally without recourse to deliberation.

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* See Carpenter, *Mental Physiology*, 1875, ch. 9.

Let us, however, analyse a case of deliberateness, since every action is not performed off-hand. [*Analyse a similar set of facts.*] It promises to be a glorious day. I have to attend a wearisome lecture on anatomy in the afternoon, and for that reason I must read up a portion of the subject. I look out of the window and across the lawn. How nice it would be, I say to myself, to spend the day watching the cricket match at Lord's! Just the day for it! It is not often that I go there either! How would it be if I went? But then what about the lecture and my preparatory work? I am none too forward in my subject. Still, one day won't make much difference. Ah! but one day cut off here, another there, a third somewhere else, make serious inroads on my time. No, I am taking a too gloomy view of my backwardness. Am I, though? How can I pass my examination satisfactorily unless I cease to neglect my work? No, I am too conscientious. A day of rest will lend me the strength of a giant. It is best to break the routine. I shall, therefore, dismiss work for to-day, and go to Lord's.

A war of words does not always accompany the act of deliberation, and for this reason in a single minute's thought we may be occupied several times with puzzling matters. The yeas and the nays, as feelings, displace each other so quickly that, as in the case of a vibrating chord, exact observation of the process becomes difficult. On other occasions, fitful feelings, blurred images and disconnected words stand for the act of deliberation. Again, the faintest momentary feeling of hesitation which is followed by a calm, is already typical of the state we are describing. [*Observe such instances.*] When the timid dog alternately attempts to slip down the high wall and then withdraws; when the fowl is as much attracted by the grain as it is repelled by the horse's hoofs; when an orang-outang wonders whether it was that particular part of the wall against which he struck when swinging; or when a pig on a country road is measuring our good or evil intentions; in each of these instances we deal with an attitude similar to the one we are analysing. [*Carefully observe the ways of animals.*] The presence of long strings of well constructed sentences does not assist, since they equally require an explanation.

In pronounced deliberation we propound a question to which we seek a satisfactory reply, and the topical interest in the reply secures a stream of but's and if's succeeding each other. This class of thought is one agreeing in every essential with that of doubt, as analysed in sec. 99b. [*Is it?*] Thus, if we represent one type of man, we eternally hesitate and deliberate; if another, deliberation is rare. Similarly with the method pursued: it is sincere and straightforward, or a mere pretext for arbitrary action—judge, jury, witnesses and defendant being bribed. Again, an ideal intellect at once sees the path clear before him, while many an ordinary man blunders along heavily.[*] Caution, fear, desire, each stimulate us to review a situation at greater or less length.

Often the debate is prolonged till we feel compelled to adjourn it. There is then no resolve or decision. When the argument in Lecture *v.* Lord's comes to a point where, everybody being bribed, Lord's is left unanswered, I clinch the matter and resolve; that is to say, the last decision stands unopposed, and I make my arrangements accordingly. Usually we let a little time expire for any startling re-opening of the case; but when that period has passed without any fresh doubts arising, we sum up the subject in a final judgment which represents the need that has triumphed for the time being. This summing-up is the resolve or decision. The psychological development of the trial we leave unconsidered, since it points to the symptoms already discussed in the analysis of doubt (sec. 99b). The whole process is only conceivable as being organised. Apart from such a conception the above dialogue is inexplicable.

For some illustrations of the deliberative process, see, among others, Bain, *Emotions and the Will*, 1875, pp. 410-1; Chmielowsky, *Entstehung des Willens*, 1874, p. 69, who says that "deliberation and resolve have for their necessary antecedent the possibility of movement and its inhibition, which possibility is derived from the accumulated experience of the child"; James, *Psychology*, 1890, ii, pp. 528-30; Paulhan, *L'Activité Mentale*, 1889, pp. 171-3; and Sully, *Human Mind*, 1892, ii, pp. 253-5.

159.—Desire.

To give birth to an act some psychologists require a midwife with many and wondrous instruments, and we are told accordingly that what we will, must have been believed in and desired previously. This elaborate but fictitious machinery was built up in a natural manner; for, bent on a psychical explanation of what is immediately given, men eagerly inquired into origins. In the outer world they had always observed that events were conditioned; so they hunted for psychic conditions. An act without any preliminaries in the way of willing, deliberating, deciding or desiring, seemed to them as monstrous as a physical substance which refused to be classified. Noticing, then, on certain exceptional occasions, that varying acts were preceded by certain classes of acts, they concluded that, known or unknown, these latter were ever present. To account for palpable contradictions, it was assumed that acts tended to become habitual, in which state they were the result of mechanical processes. *Primitive knowledge thus lays stress on prominent features rather than on general facts.* From the point of view that all action is organically determined, such invariable preliminaries become meaningless. Accordingly we have found that not psychic preambles but primary and secondary complications throw light on human activities, and, for this reason, our analyses dispense with every kind of machinery. Normally an act is just an act and no more. It requires no footmen to usher it in, and no host to utter words of welcome. Being an expression of a need, it is its own explanation and justification. We decide, then, that a desire does not normally precede an act.

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[*] Schneider (*Der menschliche Wille*, 1882, p. 290) well says that "ceaseless choosing and deliberating is not the mark of the man who is thoroughly cultured, but rather a characteristic of him who is ignorant and shifty. He who is sane, . . . always knows his business."

It is worth while to distinguish between will and desire.* In formal unopposed willing there appears to be an *announcement* of action; whereas in formal opposed desire there is a favourable *contemplation* of a course of action. The former points to action, the latter to an attitude. The one is normally realised, the other remains frequently unrealised. Where there is, however, in connection with desires a co-existing tendency to action, there we find that a volition is accompanying the desire. [*Experimentally study desires.*]

Bain, *Emotions and the Will*, 1875, p. 423: "Desire is that phase of volition where there is a motive, but not ability to act upon it." Hodgson, *Theory of Practice*, 1870, i, p. 382: "Desire is nothing else . . . than an increase in the vividness of specific pleasures or interests in contrast to the habitual feelings, or to the feelings which are vivid and painful in antagonism to them." James Mill, *Analysis*, 1869, ii, p. 327: "The simple idea of a pleasurable or painful sensation, is a desire or an aversion." Spencer, *Psychology*, 1890, i, p. 126: "Desires are ideal feelings that arise when the real feelings to which they correspond have not been experienced for some time." Sully, *Human Mind*, 1892, ii, p. 208: "A motive is . . . a desire viewed in its relation to a particular represented action, to the carrying out of which it urges or prompts."

I say to myself that I do not want to look at certain figures while about to look at others near by; yet I do so. Here there are two volitions or two needs seeking satisfaction, and not two desires merely. Thus, wherever an objectionable course is very easy it will generally be followed on the principle that easy actions tend to be realised. Hence the very thought of an alternative has a tendency to support that alternative, a desire being readily followed by a volition. Fascination offers another illustration of the above. An express train rushing by us, a precipice, or a danger generally, make us think of the possible absence of our equilibrium, and that very thought, therefore, disturbs the physiological balance.

160.—NEURAL DISTURBANCES.

Why do we pursue, or abstain from pursuing, a certain course? Because, it is often argued, that course is pleasurable, painful or indifferent. But to pursue a course which is indifferent to us is plainly absurd, the argument proceeds; therefore, either pleasure or pain determines every action. This pleasure-pain theory held its ground in reflective psychology because it offered a uniform and comprehensive explanation. To the question why a person did one thing rather than another, the reply was that the greater pleasure led to the chosen line of conduct. To the question why a man did anything at all, the answer was that pleasure or the dread of pain made man act as he did. In this manner a neat system of uniformly acting forces was provided, a system which was to account for human activities. Pleasure and pain were looked upon as feelings, and feelings were regarded as originators of change. The more pleasure the more motive power, the less pleasure the less motive power. As a plausible theory the pleasure-pain view was complete, and left nothing unaccounted for. Unfortunately, the facts do not support it. In our chapter on the subject (ch. 6), we found (1) that all systems belong to one class, and that hence there is no possibility of distinguishing effective feelings from non-effective ones, while there is no room left for unanalysable subjective states corresponding to the feelings. The power residing in special pleasure-pain feelings thus becomes more than problematical; for where is the line to be drawn between a musical note and a pleasurable feeling, if we except abstract interpretation? (2) We arrived at the conclusion (sec. 138) that pleasure-pain does not reside in feelings at all. We traced it to a peculiar nervous condition, or to certain observed changes. We saw that pleasure, pain and indifference attach themselves easily to one and the same feeling; and that we cannot distinguish pleasure-giving from pain-giving feelings, except by recourse to a test which is not feeling. Hence we cannot admit that pleasure and pain, regarded as feelings, produce changes. (3) We observed that marked feelings do not, as a rule, accompany bodily activity, and that their intensity or aggressiveness, when present, is no trustworthy guide to the existence of pleasure-pain. In the face of such sweeping criticisms the pleasure-pain theory must be abandoned. It lacks even plausibility when confronted with the facts. (4) Lastly, we learnt that the theory of need-stimulated processes makes the pleasure-pain theory superfluous, and that at the same time the former theory assumes no factors beyond those with which we are familiar.

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* "If no external action follows upon the internal, how can I be certain that I have really willed? . . . When this happens, can that resolve be said to be anything more than a wish?" (Höffding, *Psychology*, 1891, pp. 340-1).

The pleasure-pain theory which we are discussing boasts of no mere metaphysical basis, for it is derived from common observation. Taking the words pleasure and pain in their ordinary acceptation, it must be admitted that we are frequently being disturbed, *i.e.*, violently attracted or repelled. Cold is normally shunned, warmth is normally welcomed; one kind of food we usually like, another we do not; we enjoy laughter, and we flee sorrow. Psychologists accordingly generalised from passing impressions. Seeing that certain feelings of a certain warmth went with semi-opposed disturbances—pleasures, and another set with opposed disturbances—pains, they argued that every action belongs to either one or the other of these two classes.

It was easy to overlook the facts which discredited the conclusion. To illustrate: for weeks together I pass a certain spot at a particular time. A carrier's cart regularly comes along at the same time, so I believe, from the opposite direction. Do I meet that cart every day? When I see it, I think about it; when I do not see it, my thoughts are far away. Hence we easily conclude that a casually observed object is generally present. This is specially so as regards theoretical conclusions. *The very fact of our being interested in a subject, makes it progressively easier for us to re-develop instances which prove our theory, and steadily more difficult to re-develop instances to the contrary.* As men are usually unaware of this psychological tendency—a tendency useful in practical life,—the belief that we are on the right track grows apace, the swelling conviction itself aggravating the state of affairs. Unless we are specially able, specially trained, or can defeat the tendency by employing the principles enumerated in sec. 136, it is as difficult under these circumstances to see truly as when we look through glasses which distort objects. [*Do you find this to be so?*] Once we have fairly launched our theory, we are surprised at the mass of favourable evidence and the paucity of the contradictions. Were respect for direct observation (sec. 136) universal, it would be safe to state that not one out of a score of theories met with by the student would ever have ripened. Unreflective skipping, picking and choosing, are thus responsible for much wasted effort. Had the pleasure-pain theorist tested one day's or one hour's normal activity, instead of dwelling on facts strewn broadcast over the field of time, he would never have published his conclusions. Every philosophical system must, therefore, be tested by strict scientific rules. [*Do you always apply this test?*]

The tendency to misinterpret is contagious. The ordinary reader, following an exposition of any subject, rarely fails to be impressed with its validity. The facts suggested by what he reads are all of one type, and, as he proceeds, related facts present themselves readily while opposing facts elude him. Thus imperfect theories often impress whole generations of clear-headed thinkers. For this reason, too, style is of great importance, because of its power of "suggesting" favourable facts. Not even the fiercest opponents elude its wiles. An adversary's skilful special pleading staggers us, and leaves us momentarily without a word of defence, though we are sure that the facts are on our side. It requires, in such a case, some little time before what is appropriate is re-developed, and then gradually, as after an eclipse, the obscured facts become visible. The same method gives us what our opponent neglected. It was easy, therefore, for the propounders of the pleasure-pain theory to make their plea appear irresistible.

In philosophical inquiries there has been no greater moulding power than the one commented upon above. To this alone we must trace the incredible fact that though writer after writer is mistakenly convinced that what he says amends what his predecessors have accomplished, yet every fresh writer, the present author included, equally believes in his heart that with him salvation has come appreciably nearer. We are dealing with a psychological trick which, in practice, it is far easier to recognise than to escape. This failing makes all men kin, of whatever clime or age or station they may be.

We must beware of one experimental fallacy. Let us suppose that I believe in the pleasure-pain theory. I want to see whether experiment or observation confirms or refutes it. I select an apple, eat it, and think that it has a delicious taste. What am I entitled to conclude? That depends on how far I have illicitly introduced my theory. It is not uncommon for a person to enjoy a dish merely because, though he has forgotten it, he enjoyed a similar dish on some previous occasion, or for other reasons equally fallacious (sec. 126). An experiment will, therefore, be worthless when we slip into it a misleading factor; and this is readily done in such an instance as we are considering. In this way persons convince themselves that pleasure is a constant presence with them. The moment they observe themselves, they introduce what is not normally there. Nay more, convinced of the theory, they order their life accordingly, and really make pleasure play a far more important part than it would have done if speculative interests had been absent. Under these circumstances, only lines of conduct are pursued which, on the whole, yield pleasure. Of such adaptations, produced and fostered by self-deception, there are legions. Let it suffice to have drawn attention to an error which is likely to mislead all but the scientific on the one hand and the unimaginative on the other.

Again, it has been shown that willing, as a preliminary to action, is not seldom absent. That in itself settles the controversy as to pleasure-pain moving the will; for where there is no willing, there is no force needful to project us along the course. The theory is only conceivable when an aim, or a resolution, precedes the action. Where the action follows organically, the feeling as a force is out of place, for it has nothing to move.

An experimental disproof has been supplied in the previous chapter. The view which postulates pleasure-pain as a universal factor initiating all reactions must, then, be rejected as contrary to fact.

Bain, *Emotions and the Will*, 1875: "Either a pleasure or a pain, present or remote, must lurk in every situation that drives us into action" (p. 411). Again, "Place food before a bird in a cage, and at the same time open the cage and the window, and the choice between a repast and liberty represents the greater pleasure" (p. 401). Bouillier, *Du Plaisir et de la Douleur*, 1865, p. 122: "I see a thing and I desire it; I should not desire it without the pleasure which it causes me, or which I expect from it." James, *Psychology*, 1890, ii, p. 553: "All the daily routine of life, our dressing and undressing, the coming and going from our work or carrying through of its various operations, is utterly without mental reference to pleasure and pain, except under rarely realised conditions. It is ideo-motor action." Here James, as is the common practice, overstates the simplicity of routine. Robertson, *Psychology*, 1896, p. 239: "Feeling, in a case of willing, always supplies the motive power." Sully, *Human Mind*, 1892, ii, p. 236: "Feeling supplies the spring or impelling force in conation." Additional references on pleasure and pain are found in the preceding chapter.

161.—Choice from Weaker Motive.

We must discuss here a question which is often raised, and which may be illustrated by the following. [*Describe similar happenings, experimentally induced.*] In a room which I entered yesterday there were many chairs. I looked at them carelessly, and then sank into the most comfortable one and rested. Why did I not choose the most uncomfortable one? I "chose" as I did, it may be said, because I was actuated by the love of ease; I dismissed the thought of the one offering least comfort, because I disliked discomfort. The "pleasure" involved in the thought of the one, attracted me; the "displeasure" implied in the other, repelled me. Could anything, then, have made me choose the one which brought discomfort? Other things being equal, no. Now suppose, it is then argued, that a heavy penalty was attached to sitting in the easy chair, and a great reward for selecting the other. Then, the balance of pleasure and pain being shifted, we should naturally change our opinion.

Analysing the illustration, it is readily seen that organised reaction and not abstract motives were at work. Feelings, aims, resolves, desires, were absent, and, for this reason, the explanation given above proves inconclusive. We must nevertheless pursue the subject a little further. No penalty or reward is necessary to change the balance. I simply reverse my customary action, and I do so organically. If we are in an experimental mood, we may thus freely will to sit in any of the chairs without being disturbed, *i.e.*, without pleasure or discomfort arising. This feelingless will-factor, at least to those who are not intimidated by passing will-o'-the-wisps, is an important consideration. Once the will is drilled to be its own "motive," and, to a large extent, the train of pleasures and pains lose their weird power (sec. 148). When rational needs suggest a reversal of policy or habits, we obey unhesitatingly. There is no necessity to weigh the quality and warmth of our feelings.

This last remark leads to another observation. Warmth of feeling, as such, is no guide to the strength of a motive. Suppose that for years we have been making statements guided by interest rather than by truth. In that case, to go on doing what we have practised so long, is as easy as is swimming to a fish. It requires no great effort. Nay, so ready are we to pervert statements that we do it without suspecting the fact. A time then comes when new notions suggest a different course. We passionately strive to overcome the vicious habit; again and again we inwardly protest, and yet do what we have sworn not to do. Here we have a conspicuous feeling in favour of the new course, and hardly any on the side of the old. It is as if we fought an invisible enemy whom we could not wound, but who could injure us. While, on the one side, there is warmth of feeling in the zeal for reform, there is, on the other, a fixed organised inclination (sec. 146). With many persons, accordingly, life presents a constant inner struggle; they never do what they wish, and they do what they do not desire. Warmth of feeling represents one of the antecedents when all other things are equal; but it is very seldom that they are so. Usually it is a case of deeply rooted activity battling with a fresh desire. If the stronger motive be that which is connected with the greater sensory mass, then it is not the stronger which always or generally prevails. And since this is so, the question of the strength of motives must be fought out in the realm of neural inclinations. We are not guided by feeling or by immediate motive, but by organised tendencies. Let the "motive" be ever so pronounced, it still lacks meaning unless we assume an organised background. Ordinarily, however, as has been repeatedly pointed out, the old-fashioned motives do not exist. The fatal rays of the struggle for existence among systems evaporate them. We conclude, therefore, that (1) formal motives are seldom present; that (2) warmth or intensity of motive is no measure of strength; and that (3) we often freely change the balance between motives without introducing any disturbance or pleasure-pain factor. [*Have you tested these assertions?*] The real motives are, of course, the needs or functional tendencies which were enumerated in sec. 156.

162.—ACTION FROM SPECIAL MOTIVES.

I am asked whether I will take an apple or a pear. According to the motive theory what happens is this. An apple promises great pleasure; but a pear promises greater; so I take the pear. Or the contrary holds; then I choose the apple. Whenever we are offered an alternative, we are supposed to go through the above process. This theory, we see, is essentially atomic, the notion of organised thought being foreign to it. No one act, it is implicitly held, bears any but an abstract relation to any other act, while the mind substance is equally fresh to every impression. According to the view we are contending for, such atomism is untenable. Perhaps we simply take the apple or pear on which our eye happens to alight first; perhaps something particular about the fruit catches our fancy; or perhaps we pick up the nearest. Apart from accidental circumstances, custom usually decides the matter. Pleasure-pain, in the ordinary sense, is not always present.

An apple or a pear, *as such*, is a no-thing, and apart from organised acquisitions we should not even discern it by the sense of sight. For the same reason, its taste is not communicated to us by special revelation. The fruit has only a meaning for us in so far as it is one of a known class, and we can only feel towards it as we have felt towards its similars previously. If, no matter for what reason, I have habitually been attracted by its kind, I shall, other things being equal, be so now; if the contrary, I shall be repelled. In short, I shall take the apple primarily because I have taken apples before, and because of an organised inclination. The taste which now seemingly attracts me would, under other circumstances, appear loathsome or indifferent, while the more I lean towards it organically, the more unfailing shall I be in selecting it from other fruits. An object belongs to an order of objects, and this order is involved in a yet more comprehensive scheme. Anything, therefore, which a mother does or approves of is perhaps desirable to her children. Anything which has to do with the sea fascinates the sailor, though otherwise it would leave him indifferent. Anything to do with business arouses the trader's interest. Anything to do with science makes the student of nature enthusiastic. In this way men commonly look upon things from one selected point. With one man comfort, with the other studied interest, with the third ethical considerations, are the leading factors. In all happenings organised reaction is decisive, the apple or the pear by themselves determining nothing. If we are ascetics, the one as the other will leave us unaffected, and if we are lovers of fruit, we eagerly choose among them. The question is how their similars have appealed to us in the past.

Which am I to take, the apple or the pear? I pause. I weigh both classes of fruit in the scales of my predilections. I temporarily incline now towards the one, now towards the other. At last I deliberately choose one particular apple. In choice of a deliberate character, is it the quality of the object which decides, or is it the individual?

These two questions are each, according to circumstances, answered in the affirmative. The colour or size of apples influences our choice; or perhaps greediness is the motive. In the latter case we have a constant inclination which in a vast number of instances determines the variables—a mean passion uttering the last word. Such third parties are the rule, since the present reflects our past conduct. A man who is careful of his health, decides the issue on hygienic grounds; another for economic or ethical reasons. When it is a question of elaborate choice, our general being has most influence. The various needs are put in motion, and their nature sets the stamp upon the final resolution. The keenness, the fineness and the comprehensiveness of our organised judgment, contribute to the result. (Sec. 96.)

With some persons, rational considerations tell most heavily [*do they with you?*], because they are jealous of the power of objects. Such men, however, do not introduce a factor of a new kind, for, psychologically, the meanest and the most exalted motive are of equal account, and in each process there is expressed a need and no more. In the same way the rationalist's attitude is the same when he determines that he will select arbitrarily, *i.e.*, when he permits any passing circumstance rather than the usual one to settle the direction of his activity (sec. 152). *If he has trained himself to ignore normal impulses, the result in itself forms one of those normal impulses*, and the situation has, therefore, remained psychologically unchanged. We have seen in sec. 152 that arbitrary activity is like any other kind of activity. In fact, it is no more capricious to let an accident than to let a rule settle a dispute. It is possible, in some persons at least, so to train the impulses that no average object shall have more than a passing influence. In any case, it is inadmissible to assert that felt or prospective pleasure-pain is the normal and necessary determinant in human activity.

On the subject of the last three sections, consult especially Bentham, *Principles of Morals and Legislation*, 1823, i, chs. 1 and 2; Gizycki, *A Students' Manual of Ethical Philosophy*, 1889; Green, *Prolegomena to Ethics*, 1883, bk. 2, ch. 2, bk. 3, ch. 1, and [illegible] 4, ch. 4; Hodder, *The Adversaries of the Sceptic*, 1901, ch. 9; Höffding, *Ethik*, [illegible] Martineau, *Types of Ethical Theory*, 1889, part 2, bk. 2, chs. 1 and 2; John [illegible] Mill, *Utilitarianism*, 1863, ch. 2; Sidgwick, *Methods of Ethics*, 1893, who ex[illegible]ly deals with the subjects; and Leslie Stephen, *Science of Ethics*, 1882, chs.

163.—I WILL.

Looking upon the nervous system as part of an organism, one can readily understand that to it is due the initiation of bodily activity.* Its original constitution, its power of growth, its impressibility and irritability, and its environment, trace for us the necessary history of every human being. This conception of the process, if correct, must enable us, in the final issue, to explain everything, including those additional factors which newly gathered facts may point to.

How, then, on our assumption, are we to understand such a term as "I"? Evidently, in the same manner as a certain objective complex is spoken of as a ship or a daisy. The objective complex, on the physiological side, is expressed in this instance by what we may roughly call the brain or the central nervous system, and the word "I" must, therefore, be explicable in neural terms. In a ship the relation between the parts is mechanical, and hence they are, to a large extent, independent of one another. Not so with the daisy. There the parts are intimately connected, and what affects any portion of it often affects every other. The daisy is hence much more truly one than the ship; and the brain is, of course, comparable to the former rather than to the latter. A shock of pain or joy, or a blow, may put an end to the vitality of the neural organism, though the shock or blow has no direct physical effect on more than a limited area.

Suppose I am asked "Will you do this?" and I reply "Yes, I will do this." What do I mean here by "I"? If what I am asked to do is nothing out of the common, my answer comes unhesitatingly. There is a stirring and a consent of the organism, the consent being communicated verbally or by other signs. Organised reaction, we know, explains what happens; but what exactly interprets the word we are interested in? What does that stand for? We are aware that ordinarily we repeat without unfolding implications; yet here we ought to assume that we are doing so. To the word "I" we frequently attach hardly any meaning; often it is a name for a person; and, at its best, it embodies many characteristics. It is precisely as with any other object: we re-develop one or other of its aspects when we think of it. The word "I" refers no more to an essence beyond thought and action, than the words daisy or ship. It belongs to the same category. Thus when we use the pronominal "we" or "they," we loosely denote an assemblage of certain objects. Just as we say that the stone is cold, when but a portion of it is, so we constantly speak of ourselves as a whole when only this or that need is implied. Convenience permits apparently no other use of language.

When we say "I will do this," it is not necessarily implied that the

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*"The reason for mental unity . . . . is to be found in the simple fact that the mind is the expression of an organism and that every organism implies co-ordination, a harmonious functioning of its various parts" (Paulhan, *L'Activité Mentale*, 1889, p. 413).

whole of "me," or the total organism speaks; for usually only a small portion is involved. When ordinarily a certain need is aroused, then only what is required for its satisfaction is implicated in the "I," and that because the quantity of attention is limited, and because, therefore, the satisfying of one need often absorbs it. If we were to look from all possible sides at every demand made on us,—an impossible task,—we should never decide on anything. Thus the greater part of our nature lies low and says nothing when an appeal is made to any one fraction. Were we living as solitaries, words such as "I" might be dispensed with, though the organised nature of our being makes a general term reasonable. We could say "This shall be done," "The imagination has been active to-day," "The feet are tired," "The judgment was faulty," "That is satisfactory." We could readily class ourselves with the surrounding objects. Since, however, we live with others, some mark of distinction is desirable, and the use of "I" indicates no more than that. The phrase "I will" is an amplification of a usually limited organic consent or determination, and no more.

We sometimes assert that we perform an action against our will (sec. 156). Such an action is as much ours as any other action. We have no desire for it from one point of view; but desires from other points of view, compel us to act. To say that "I do not *choose* to act thus," is only a colloquial manner of stating such a fact. In a similar fashion we regard abnormal aspects of the self as if they were unrelated to us, *e.g.*, when we are unable to control our thoughts.

Often, again, the "I" is identified with our ideal. The spirit says one thing; the flesh another. While we wish to think of some worthy aspect, a loathsome thought obtrudes itself. In such instances, it is allowable metaphorically to attach the first personal pronoun to what we consider rationally the higher; but only metaphorically, for otherwise the whole of psychology would be thrown into confusion. Psychologically there is nothing to distinguish the appetitive stimuli from the spiritual ones; or the recently acquired ideal from the deeply rooted objectionable dispositions. The war between desirable and undesirable needs, the constant struggle betwixt the lower and the higher, is a matter of indifference to the psychologist, *qua* psychologist; for he is only concerned to see whether what happens stands on the same plane as regards fact or not.

Psychologically, all needs are equal. An acquired and obstinate aptitude to act in opposition, for the purpose of asserting one's individuality,—one's independence of matter,—is the expression of a need on a level with others. The imagination may enthrone, and has thus enthroned, innumerable notions.*

Every object whatsoever is continually changed by its necessary interaction with its environment, and this is especially so with animal organisms of a high type. The more important adventures of such an organism modify it considerably, and fit it out with its specific individuality. When, therefore, we think of a fellow human being whom we know, we consider his physical appearance and the environment in which he is placed, and we take note of the peculiar way his thought flows and the particular things that most attract him. The manner of the development of secondary complications, especially of those which are most far-reaching and recur oftenest, thus offers a full explanation of the development of an individuality. If, again, we wish to distinguish the "immaterial" from the "material" self, then we omit the peculiar exhausted complexes of touch, resistance and sight, called body, and think of what we have spoken of in this work as the "feelings," especially those connected with the stream of thought, *e.g.*, combination feelings, emotions, etc. We also include the train of memories and the way in which these are most generally compounded to serve as a basis of new developments. As we shall see, however, in the next chapter, the so-called outer world is strictly one with the inner, and is built up gradually as is the so-called individual ego. Hence circumscribed differentiation alone distinguishes the various complexes of which *our world* consists.

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* The question of the "I" requires to be thoroughly re-examined. (See sec. 176a.)

Such phrases as "*I* see," "*I* feel," "*I* am conscious," should not mislead us. All they involve are complications: *certain articulate sounds*, *certain combination feelings*, and *a certain history which accounts for the utterance of those words at that particular time*. So when I say that I am *conscious* that I see a book before me, it is merely a case of observation of the book and observation that I observe two systems connectedly.

It has been said that psychology, unlike the physical sciences, is individualistic, and deals with the individual rather than with the universal. There are two answers to that. If by it be meant that psychology does not deal with facts true of all minds, then the statement is scarcely defensible; and if it be urged that it is indispensable in psychology to attach what happens to some some-thing, then the reply is that that is equally true in physics where we have to deal with particular masses as they exist. If it be still contended that physical science deals ultimately with atoms rather than with the fortunes of particular masses, then I claim that psychology ultimately constructs the total universe out of world-atoms, *i.e.*, simplified touch feelings. It is only the backward state of our science which compels a more individualistic treatment than would otherwise be necessary. As the science advances, the whole psychological terminology is sure to be purged of its individualistic character. At worst, however, psychology should be classed among the biological sciences.

The problem of this section is fully discussed in ch. 8. The question of the self is dealt with, among others, by Bradley, *Appearance and Reality*, 1897; Dumont, *De la Sensibilité*, 1875, pp. 89-92; James, *Psychology*, 1890, ch. 10; Lipps, *Grundtatsachen*, 1883, ch. 19; Paulhan, *L'Activité Mentale*, 1889, p. 165; Sully, *Human Mind*, 1892, i, pp. 235, 264, 475-83, and ii, pp. 223-4; and Wundt, *Grundriss*, 1896, p. 261.

164.—WILL AS ASSERTION.

Our interest in dramatic action is great. The impressive scenes of life engrave themselves sharply on our character—so much so that everything else is either ignored or interpreted by their light. The activity implied in imagination and that involved in common habits, are looked upon by us as if they lacked reality. Even the portions which make up a complicated act are only considered as results of one effort of will, because interest fastens on what is most striking. When the nature of action is thought of, a telling incident is re-developed and that stands for activity in general. For a like reason, the will has allotted to it a prominent position in primary and secondary processes. An imposing will, a capacity surpassing that of the average man, challenges our dramatic faculty. It appeals to the eye and to the stronger emotions. Yet, psychologically, there is no justification for placing the will on a pedestal and doing homage to it.

Not what is soul-stirring, but what is general, interests the man of science: and as, from a broad standpoint, willing is a casual event, it must be ranged with other events of a like nature.

Volition is a particular instance of assertion. Some one makes a statement in my presence, and appeals to me for support. I say, "Yes; it is true." Such assertions as to reality must in the nature of things be rare, and, in truth, no one pretends that we endorse separately every proposition that we hear made. We might as well claim that when listening to an ordinary discourse, we study, from the point of view of historical grammar, every word and phrase. There is a time for saying Yea and a time for saying Nay; we are not constantly saying Yea and Nay, affirming and denying. What is true of assertions when truth is in question, holds good generally. "It is good," "it is beautiful," "it is clever," "it is humorous," "it is practical," "it is real," "it pleases me," these belong to the same category. Ideally speaking, we might be asserting continuously; but as a matter of fact, verbal assertion is incidental and accidental. [*Test this.*] Every moment of our waking lives we are modified in some way; but we generally stop short of commenting upon the fact. Were it not so, every pebble, every tree, every blade of grass I see, would be followed by a little speech, as "I see a pebble" or "I see a blade of grass." Now in "willing" there is present a need which is waiting for an opportunity to realise itself. Willing is hence a kind of self-assertion. Just as a dog is determined to obtain a certain bone, and keep it when once procured, so a human being shows determination and expresses it verbally by such phrases as "I will." In such instances *there is present a need which will realise itself when occasion offers, and our "I will" merely expresses that fact prophetically.* Perhaps a time is approaching when strong wills shall be common; and then "willing," like anything which abounds, is certain to be considered as of little importance, while keen insight may perhaps occupy its place. Science, therefore, must not be swayed by practical and temporal considerations; for it belongs to eternity rather than to particular ages and aptitudes. The incidental "I will act," must be classed with the incidental "I will see" or "I will appreciate;" or with "I shall act," "I shall see," "I shall appreciate."

The fictitious machinery which is brought forward to initiate a "willed" act may be introduced to explain all forms of assertion. Thus, how comes it that I see a tree? It is, it may be argued, because it gives me pleasure; because the strongest motive has prevailed; because I willed to see it. Why do I consider the inkstand before me real? Because pleasure bids me to; because I am moved to it by such and such considerations. Deliberation, hesitancy, weighing, doubting, believing, resolving, deciding, acting, each find their fit place in every kind of human event, and all are on an equality. If the need is of one class the peculiar question is, What shall I think? or, What shall the verdict be? rather than, What shall I do? We cannot, therefore, be too much on our guard against the abuse of scientific progress by practical interests. A popular psychology, elaborated in accordance with the notions which prevail in common life, is apt to classify facts according to their importance among those who have built it up. A theoretical psychology has to satisfy theoretical requirements, and these are often outside the pale of the startling phases which mark the social advance of the race.

In probing the nature of "willing," we have seen that whether distinct or not, it is equally organised. Naturally this is true of assertion in general. Instead of saying "I see," I can say "Hm?" or observe in varying degrees the feeling of awareness or connection, or there is present in me a feeling of recognition not understood as such; or there is nothing to mark off the event—by far the most common case. The proper place for the discussion of "willing" should be in the chapter on Systems as Need-satisfying, where the general modes of satisfying needs are dwelt upon. There it would be grouped with occasional states such as doubt, belief or assertion.

165.—The Absolute Value of Felt Effort.

The greatness of an effort, as felt, is not directly related to the greatness of its effect. [*Lift a heavy object, experiment with it, and observe the consequences.*] By itself the former is an illusive measure of results, and nothing can be deduced when we only know its warmth or intensity. In practice this works out in various ways. As a child of five I make a prodigious effort to lift a heavy object and fail; grown to maturity I raise the weight without feeling any strain. It is not the more strenuous attempt, but the state of the organism which accounts here for the divergent results. As the physical structure grows in capacity, so the felt effort is followed by more striking effects. A powerfully built man performs tasks without any appreciable strain which weaker mortals can only accomplish by exhausting efforts.

What is true of motor action generally, holds good of every department of activity. Though I try to keep my eyelids open in order to remove a speck from the eye, they remain tightly closed. [*Test this.*] My deliberate aim is frustrated by rooted organised aptitudes: but what effort cannot do, training accomplishes. If I return again and again to the attack, the organised effect will be such that I shall probably be able to place an object between my eyelids without any opposing tendency asserting itself. [*Acquire this trend, recording your progress.*] Not effort, as such, but organisation is usually decisive; the former only supplies us with a notion of the limits of the organism at any time.

Having finished their day's work, many persons are only fit for light recreation. It is out of the question for them to pursue private studies: they can neither grasp what they read nor re-develop the contents. They try repeatedly, but in vain; and at last they become resigned to their limitations. Others, again, are never tired; they can always add to the work which they have in

The same holds good with regard to the guidance of thought. An acute reasoner can start upon the solution of a problem when and at what point he likes. He proceeds with it at his leisure, dismissing it when he thinks fit. Irrelevant issues do not arise; accidental suggestions do not annoy him. [*Is that so with you?*] Just as a bat goes at full speed and yet without apparently a moment's delay changes its direction, so the competent thinker is free to leave his subject or pursue it to its conclusion. Likewise prejudices, likings and irrelevant considerations do not detract from the quality of his work. With a thoroughly trained intellect of this character clockwork regularity and accuracy is normal. With those who are untrained it is otherwise, for they appear to have no control over their thoughts. Problems come uninvited and vanish in the same fashion, and any side issue throws them off the track. They can neither start nor finish when they like. Wishing to think of one thing, they are bound to think of some other instead. Desirous of solving a problem, they make no progress. Impertinent issues, prejudices and foregone conclusions deprive their attempts of all value. Highly trained or untrained individuals do not differ from each other in the quantity of effort put forth, but in their native or acquired capacity. That I will at all, is determined organically, and that my will shall realise itself is in each instance decided neurally.

Exertion itself is an organised quality. One man with a highly unstable nervous system breaks down under the least trial, while another with a robust constitution continues to make strenuous efforts without overtaxing himself. Strictly speaking, we must regard the capacity for strenuousness as varying indefinitely from zero upwards. The lives of two persons, on a certain occasion, depend on their presence of mind, and life is dear to both of them. Yet one shows self-control, and the other does not. Varying experimentally—in imagination—the exertion capacity of an organism, we now see it go down to naught, and now reach unprecedented heights. Thus the man of great will-power is an organised product. If we were at liberty to experiment with his physical constitution, we should find that the will-power is no extraneous factor, and that organisms analogous to his would exhibit the same characteristics that he does. Besides, a strong will is often only an effective will, one that is readily and without effort followed by the desired actions: being practised, for instance, in dismissing undesirable reflections, we are in that direction all-powerful. [*Practise dismissing one particular class of thought.*] In fact, before a thought has fully emerged, it is without the slightest difficulty thrust into the background. By a similar exercise of will we freely turn away from anything we are dwelling on. On the other hand, we may be in such a condition that we desire, but are unable to make an effort or produce the effect we are bent on (sec. 23). In analysing a difficult problem, our will is frequently defeated. Hence effort and willing are meaningless unless we think of them in connection with an organism.

It has been argued that we are responsible for our habits, since we might have prevented them from arising. There is no occasion to refute at length such a contention, for organised reaction begins neither with manhood nor with adolescence, but with infancy. No one who has closely followed the growth of any child from birth onwards can seriously urge that the habits of the one age do not form the foundation of the next. Organised reaction has no beginning, nor is it initiated from without (sec. 62). Our capacities develop; they are not made. The quantity of exertion put forth, as well as its direction and effectiveness, are measured by the stage of development which the organism has reached. So also the character of men is the outcome of the conditions under which they live. We are, therefore, never far removed from our past in thought and action.

166.—The Sense of Effort.

[*Let the student repeat the following and related experiments and record results fully.*] I hold a penholder between my fingers and thumb. Now that I attend to the act, I note certain feeble feelings of touch, but hardly any which suggest pressure. Ordinarily these results would not be noticed, and furthermore, since the task is one which the organism is more than prepared to bear, the general current of attention is scarcely affected. I now press harder, as hard as I can. I observe that I cease breathing, that I press my lips and teeth together, and that the field of attention is very nearly annihilated. There is a sense of effort* present, and the feelings connected with the increased exertion constitute the sense. Just to grasp the penholder is not exhausting; I hold it thus for a considerable time before I am fatigued, or before it requires an appreciable effort to continue. From the second chapter we know that only a small portion of extra energy can be expended at once, and that only for an insignificant period. The feelings speedily become more pronounced, while the capacity for persisting declines. *An effort*, on the physiological side, *is a quickly-exhausting act* [*test this*], and the peculiar feelings and strains are synonymous with the sense of effort, and derive their name from the connected exertion. Let the power of the organism be increased through appropriate exercise, but without the knowledge of the individual. Let that individual then hold in his hand a weight slightly heavier than he is accustomed to, and he will feel no strain, allowing for mistaken judgment. When, therefore, the expenditure of labour in any direction exceeds the normal expenditure, certain systems develop which are named the feeling of effort. Eliminate these, and the sense of effort is gone.

The sense of effort is synonymous with the feelings observable in heightened activity. These feelings, however, are not to be regarded as productive of changes; they do nothing; they but accompany the changes in body or in notions. At best, they are a coarse instrument of measurement. They are not antecedent, but consequent or accompaniment, and are not distinguishable from other sense systems. It is the occasion which gives them an apparent purpose; otherwise these feelings will, and do, bear diverse interpretations. The ordinary movements of the head, eyes, body, etc., are mostly executed without suggesting the notion of effort; but when, as in trying hard to re-develop something, the head droops, the forehead resembles a ploughed strip of land, and the eyes lose their expression, then we connect with our search these abnormal movements and the feelings which accompany them.

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* Dewey (*Psychology of Effort*, 1897, p. 51) holds that "Effort is nothing more, and also nothing less, than tension between means and ends in action, and that the sense of effort is the awareness of this conflict."

I observed in the last paragraph but one, that in pressing the penholder between the fingers I ceased breathing. [*Repeat the experiment.*] I try now whether this act of suspension, otherwise so common, is essential. I press, and successfully exhale at the same time. I then breathe normally. In further attempts I note that the field of attention need scarcely be affected, that, indeed, with the attention much deflected, I may press and yet not feel (sec. 19). In this manner the feelings and movements common to effort can be largely varied. One person, when thinking, has the brow smooth, another has one perpendicular fold nearly between the eyes, a third has the forehead lined horizontally. [*Catalogue persons from this point of view.*] There is, in strenuous acting, a great variety of sensory systems, most of which do not seem indispensable, however regularly they develop. Suppose, however, that each of them separately may be absent, yet the sense of effort, nevertheless stands and falls with them. Let there be no extra feelings, and the sense of effort lapses, as when the attention is turned away. As the feelings which we call a headache, do not lower the quality of thought, but are themselves expressions of the total effects of the disorder; so the sense of effort is a bald illustration of some neural fact. [*Experiment with elastic bands.*]

Clearly marked strain is only noticeable in *wearying* action. To suspect it everywhere, therefore, is to reason crudely. Water boils at 100° C., does it similarly boil when it is freezing? Boiling water bubbles; does water at an average winter temperature bubble? A hot poker applied to my finger-tips produces a blister; does a poker ordinarily blister finger-tips? The key of a piano forcibly pressed down yields a note: does a key slowly pressed down give the same result?[*] In an analogous way we must reason that the existence of an appreciable sense of effort or of any system, under certain circumstances, is no guarantee, unless special evidence be forthcoming, that it is always present. In the absence of such evidence we are justified in assuming that the sense of effort is only an accidental occurrence which results, and receives its name, from abnormal exertion.

The systems implied in strain are, however, pretty general in the realm of neural activity. Whenever, in normal thinking [*test this carefully*], a slight obstacle is encountered, it is at once organically met by a slight effort or felt activity. We do not notice these occasions; they are too insignificant and too numerous. It is even hard to observe them, so frequent are they. Indeed, there can be no relevant thinking, imagining or developing without perceptible strain (sec. 134). When, for instance, we are accustomed forcibly to dismiss a thought, it requires counter-training to control that tendency.

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[*] Many psychologists, from Leibnitz to the present day, reason in this manner. hole theory of minimal sensations and images is thus based on rash inferences.

In interest, especially when it is "breathless," the feelings we are discussing in this section are common. [*Test this.*] The interest is aroused imperceptibly, and a great deal of extra energy is employed—with the results detailed—without our having any knowledge of the fact or any connected or conscious aim to produce the effect. In these cases we are usually unaware that there is a special draught on our strength. We pass, for instance, through a portion of a picture gallery, and afterwards we notice that our head aches. We have been observing too closely; we have drawn too much on our fund of energy. Any one who has watched us could probably trace all the signs of the sense of effort; but the exertion is so continuous that we do not observe the fact.

In the various forms of surprise, the same features are repeated. [*Is that so?*] The breath frequently fails us; the muscles stiffen; the world is nearly a blank. We are in these cases in the same condition as when about to embark on a difficult task. Properly, surprise should be classed with the sense of effort. Our being unaware of our condition is no barrier to such classification, for the sense of effort is sometimes keen and yet its presence is unsuspected, as in breathless interest, or, as sometimes happens, when we are tired and still continue to work. With surprise must be grouped such sets of systems as terror, admiration and awe. In each of these the same tendencies are observable.

Surprise, interest and fatigue are not the only quasi-passive expressions of the sense of effort. Wherever there is a tendency to direct the attention into one channel exclusively, there we discover them. Different classes of work make varying demands upon us: now we meet an obstacle which is easily overcome; and now we become entangled, our onward march is blocked, and we extricate ourselves with difficulty. Thus attention frequently reaches a high degree without our being aware of the fact, and when it is developed most completely, we become engrossed, absorbed, lost. The bells ring, the carts rattle along furiously, people hurry past us to right and left, some one shouts our name close by; but to us these things are as if non-existent. We are bent on some pressing business, and are unapproachable except from that direction.

Listening should be considered as a special case of effort. [*Test.*] Enraptured with the songs of birds, or nervous at night, we pay prompt attention to the slightest stir among the branches or the faintest crack of the rafters.

Disturbances, or pleasure-pains, in one of their aspects, exhibit the same features. When we enjoy our strawberries and cream, we unknowingly but none the less deliberately prolong the pleasing torture. We dwell on the taste, stopping short only of satiety. We turn our attention to it, and become engrossed. We try to retain the aroma as long as possible.

Effort is thus often connected with semi-opposed disturbances or pleasure. In opposed disturbances or pain, attempts are usually made in the opposite direction. We bite our lips; we scream; we seek for distraction; we make violent movements; and the like. [*Observe a number of experimental instances.*] As in interested attention, the various movements in pleasure-pain are not determined by choice. They are such as are native to the organism; and such as we detect in other species of animals. "Aimless" effort is, of course, more common in minor disturbances. When, with us civilised beings, the disturbances are great, we take special measures to retain or dismiss them.*

It is not easy to account for the frequent inhibition of breathing when something is to be done. One reason is undoubtedly that the noise we make in breathing often interferes with attention to sounds, and even perhaps to other sensations. The matter should form a subject for experiments.

Prof. James is the champion of a supernormal will, a will that quite arbitrarily turns the balance of motives. I have only space for two quotations from his *Psychology*, 1890, ii: "The immense majority of human decisions are decisions without effort" (p. 534). This is wholly incorrect, unless he means by effort great and prolonged effort. Again: "Effort complicates volition . . . whenever a rarer and more ideal impulse is called upon to neutralise others of a more instinctive and habitual kind: it does so whenever strongly explosive tendencies are checked, or strongly obstructive conditions are overcome" (p. 548). Sully (*Human Mind*, 1892, ii, p. 291) says on the subject: "The intervention of effort as an altering, reversing factor, analagous to the addition of a scale-turning weight, probably means in physiological language the co-operation of certain highest or latest developed nerve structures, the action or discharge of which makes good the biological deficiency, or effectually inhibits the biologically excessive action of certain lower nervous planes."

I once observed a good illustration of the sensory nature of excitement and emotion. Something surprised me very much. I noticed how warm I felt all over the body, almost to the verge of discomfort; and how my heart beat so violently, that it seemed almost painful. I then effectually compelled myself to think of an unrelated subject, and the excitement disappeared from thought. If we, therefore, abstract the warmth, the violent heart-beat, etc., it becomes absurd to speak of being moved or excited. Of course, we often say "I am so sorry," when we are entirely unmoved; but in those cases we ought to say "I could be so sorry." If we had never had the physical sensations which express sorrow, the words would possess no more meaning for us than the phrase "this is a pretty colour" possesses for a blind man. An ideal being, however, would have one supreme neural inclination easily controlling the others, and he would display no strong emotions except those of joy and sorrow.† However, in the common order of things, alas, "the mind is an orchestra, where the musicians are not always in agreement; where the conductor, when there is one, is not always obeyed" (Paulhan, *L'Activité Mentale*, 1889, p. 413).

167.—THE TRIPARTITE DIVISION IN PSYCHOLOGY.

Speculative sciences are the mirrors of their times. They owe their origin to the restricted interests of a period, and they interpret the more or less common wants, and clothe them in a literary garb. As fast as the aspirations of men assume new forms, so these studies are remoulded. Thus in the history of speculation there is change, but not progress. If it be said that the physical sciences are not, like time past, unchangeable; that many a physical theory is found to be incomplete; and that many supposed facts turn out to be fictions, the answer is that, broadly speaking, physical science, as compared with speculation, is coherent and progressive. Time perfects the former, but merely changes the latter. Physics, like a child full of vigour, joyously runs ahead; not so philosophy.

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* Dewey, *The Psychology of Effort*, 1887. † See Paulhan, *Les Caractères*, 1894.

The threefold division of psychology into Intellect, Feeling, Will, should thus be connected with notions floating in the air of the eighteenth century. It was no exhaustive examination of the facts which yielded that classification. It had no better warrant than, say, the bipartite division into Intellectual and Active Powers, which was changed by the fickle popular imagination. In the dry light of the earlier part of the eighteenth century, everything was examined with the microscope of reason. Feeling, therefore, was not thought of, and hence its absence from the early treatises on psychology. Philosophers were then too prudent to allow themselves to be swayed by passion, and self-interest, mostly unenlightened, was the spirit which guided them. As morality was interpreted as a prudential arrangement, passions, good, bad and indifferent, were despised and neglected. With the influences which found for their chief spokesman Rousseau, the tide in favour of feeling and enthusiasm rose. The comfortless beacon of the intellect was cast into the shadow by the fierce flame of the emotions. Henceforward the feelings could no more be neglected. The Intellectualists, with their prudential calculations, had now to adopt a classification which included feeling. The new enthusiasm came to be recognised in the then current psychology.

After a time, morality took another direction. It had tired of prudence; it revolted from the sensuousness of the pleasure-pain view. Hence arose the will-theory which, elaborated and glorified by Kant, took its place in the tripartite division. Apart, however, from the erratic trend of popular opinion, the division was unjustifiable, and psychology has thus been an apology for unstable beliefs. If John Locke had been independent and had, for example, insisted on sensation and self-interest as the subject-matter of psychology, he would easily have found followers. Were it not that intellect enters so largely into philosophical treatises, it might have been imaginable that it could be omitted from a classification which purported to be comprehensive.

Science proper must take no account of the moods of the ages. It must arise, not from the study of opinion, but from the examination of facts. Hence the rejection of the prevailing tripartite division, and the criticism of the position allotted to the will. Except as regards complexity, I recognise no fundamental distinction between feelings, emotions, and sensations; they belong to one class as regards the sensory content. And as to the intellect, it must take its place as a secondary principle. *Psychology only knows of needs and the process by which these needs satisfy themselves.*

The will-theory is closely connected with existing metaphysical views. For that reason I have felt bound to criticise it in detail. Otherwise the chapter might have been filled in part, and to greater advantage, with a more detailed exposition of the needs which uniformly initiate and sustain action.

It was not individual whim which suggested the old psychology. It was always some social departure. Had the changes proceeded along other lines, or had they been owing to individual idiosyncrasies, the classifications might have varied a good deal more. Thus desire, which is much more prevalent than will, might have occupied the latter's place. Especially would that have been so, if social transformations had favoured such a doctrine. As the result of a possible turn in events, for instance, men might have been tormented with aching desires. Psychology would then have been christened The Philosophy of Desire. Further, the judicial attitude of calm deliberation is very rare. Imagine it universal or widely disseminated, and judgment would take the leading place in psychology. A keen intellect judges rather than reasons; observes rather than works in syllogisms. Such a change in public opinion would quickly react on intellectual studies. In the same way belief in some quarters and emotion in others, have gained a high distinction. Thus habit, attention and other incidental aspects might have taken the place of will. If they have not done so, it is because of the caprices of the social trend. Science proper has never yet sanctioned a dressing-up of public opinion, and hence I feel no compunction in dealing in what may seem an uncharitable way with an almost universally accepted classification.

It may be useful to subject once more the Tripartite Classification to criticism. We are told that the subject-matter of psychology has three fundamental aspects, namely, Feeling, Intellection and Volition; these three factors being invariably present. Furthermore, Feeling is most generally defined as pleasure-pain; Intellection or Cognition as reasoning, and Volition or Conation as willing. It is as though it were said that the subject-matter of the physical sciences has three fundamental aspects, namely, Violence, Interaction and Force; and this classification would be as irrational as is the former. If we define Feeling as being the sensations we name throbbing pain, piercing pain, etc., we learn, as we have seen, that these sensations are valueless as guides to the interpretation of pleasure-pain; and if we define Feeling as something not to be expressed in terms of sense or change in sense, then we have something about which no one can either affirm or deny anything. Pleasure-pain, however, indicates a casual process of a violent nature, a process which is *not* an invariable aspect of every set of systems. Pleasure-pain is merely *violent* action as distinguished from action generally. Coming to Intellection, we have a case similar to the one of Feelings. If Intellection means reasoning, as ordinarily understood, then it is not a constant aspect, for we are not always reasoning; and besides, it would exclude all the work of elaboration which goes on in bodily action and in the forming of sensations. If Intellection, again, means Interconnection or Interaction (or the satisfaction of a need), then it covers the whole ground; but this is not the accepted meaning. Lastly, as to Volition. If Volition means resolve, determination, self-directed activity, etc., then Volition is a very casual process; if it means striving or conation, as water flowing downward strives, then it is only true to an extent, and is otherwise a petty, superficial aspect of action, as if we said that everything in nature *strives* to change its state; and if by Volition be meant impulse or action, we have still a very vague generalisation. Yet these positive facts of the Tripartite Classification are overshadowed by faults of omission. That classification leaves entirely out of account the existence and nature of the sense material; it says nothing of the evidently organic nature of psychic-processes; and it tells us nothing of the great and uniformly acting functional tendencies which explain the trend of thought and action. In fact, the Tripartite Classification is hopelessly unscientific. For a further criticism of the Tripartite scheme, see Lipps, *Grundtatsachen*, 1883, pp. 15-27.

Sully (*Human Mind*, 1892, i, pp 59-70, and Appendix A) gives an account of the Tripartite division. See also Bain, *Senses and Intellect*, 1894, pp. 2-8. *By Intellection, or Interconnection, might be understood the need-determined elaboration of primary and secondary systems; and by Systems, or Developments, the whole material of thought and action-systems are developed and re-developed.* The first class would deal with primary and secondary systems dynamically, while the second would treat of them statically.

168.—A BIRD'S EYE VIEW.

The bodily structure which we inherit tends to maintain itself and to develop itself. We speak accordingly of functional tendencies, and these functional tendencies or needs we look upon as the stimuli which set us and keep us going. Psychology is properly the science of needs.

Additional References.—Bain, *Notes on Volition*, 1891; Bastian, *On the Neural Processes underlying Attention and Volition*, 1892; Bradley, *On Pleasure, Pain, Desire, and Volition*, 1888; Bradley, *Some Remarks on Conation*, 1901; Davies, *The Growth of Voluntary Control*, 1899; Fouillée, *Existence et Développement de la Volonté*, 1892; Kirkpatrick, *The Development of Voluntary Movement*, 1899, Lindley, *Motor Phenomena of Mental Effort*, 1896; Loveday, *Theories of Mental Activity*, 1901; Marillier, *Les Phénomènes Moteurs et la Volonté*, 1890, Pfander, *Das Bewusstsein des Wollens*, 1898; Schubert-Soldern, *Reproduction, Gefuhl und Wille*, 1887; Shand, *Attention and Will A Study in Involuntary Action*, 1895; Stout, *Voluntary Action*, 1896; and Woodworth, *The Accuracy of Voluntary Movement*, 1899

CHAPTER VIII

SYSTEMS AS UNIFIED*

Brain hath oft been pitched 'gainst mind,
Yet the two are one, we find.

169.—OBJECTIVE, REFLECTED AND IMAGED SIGHT.

Straight in front of me I see a certain room. When accidentally turning round I notice, to my astonishment, that another room runs parallel to the one which had developed a moment previously. However, it gradually dawns on me that at my back there is a looking glass and not a room. Which out of these two sights, then, from the purely visual point of view, is the real thing? Or is there no difference between the pair of pictures? Repeated examination compels me to state that, apart from non-visual and indirect evidence, the two rooms convey to me precisely the same impression. The sense of sight is, therefore, unable to divide things as such from their reflections in a glass, and hence a reflex of the objective or exhausted world is the same to us, *as visuals*, as the objective or exhausted world itself.

I now shut my eyes, and re-develop the sight of the room. Does this image fundamentally differ from the object and the looking glass picture? I fail to see where. Except for unimportant circumstances (sec. 124), the primary and secondary visual worlds, or the visual worlds of sense and imagination, are one. Each has depth, breadth and height, and these qualities are the specific attributes of the visual order. To reason that one picture is confined in a small brain area and that the other occupies a thousand cubic feet, is to confuse the issue. Visually speaking, the brain area and the imaged room are but two visual systems and do not dwell in each other. A room, whether "objective," reflected in a mirror, or imaged, occupies visually the same quantity of space. [*Is this so?*]

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* The present chapter makes no pretence of being a full and final answer to the deeper problems of existence. Its object is not so much to convince as to stimulate, nor are the more important statements put forward with authority or confidence. My aim has been to challenge the very bases of dualisms or aspect monisms, and to insist that only experimental inquiry is admissible in the solution of these problems. Speculation or reflective scrutiny is here as everywhere else impertinent, and worthy only of those who draw their inspiration from the remote past. I may add that, for many reasons, I have thought it wise not to encumber the chapter with literary references.

The nature of mind is discussed in sec. 176a.

The three-dimensional nature of visual *images* is more obvious in theory than when examined. With me relief is generally imaged where it had been previously sensed. For example, in imaging a friend whom I recently met in a certain street, there is a vague image of the pavement on which we stood, of the houses which bounded the pavement, and of the friend himself. The picturing of the situation, especially with the lapse of time, is far from rivalling reality, though the main features are retained. However, if there be any persons [*are you one?*] whose images are invariably blurred, colourless and lacking in environmental detail, they will, in imagination, only see ill-defined shadows, that is to say, their imaging will be two-dimensional and not three-dimensional. [*Experimentally compare sensed with imaged systems, as to colour, detail and depth.*]

170.—OTHER CLASSES OF SYSTEMS.

What is true of the sense of sight, holds good of all the other senses, separately and in combination. The secondary systems or images, where they exist, are in every instance indistinguishable, except in certain non-essential characteristics, from the related primary systems or sensations (secs. 124 and 181).

There are some systems which are usually excluded from the list of sensations and images. They are vaguely spoken of as "a pleasure, a volition, a thought" (Bain); "thoughts, sentiments, and desires" (Sully); "ideas, feelings, and volitions" (Wundt). If we analyse these vague conceptions, a new fact becomes patent. These special systems are of precisely the same texture as the so-called primary and secondary systems. A train of thought (a secondary combination), for instance, is a series of units of various degrees (sec. 107) woven together by the pressure of needs, and each separate portion of the train is capable of entering into many combinations. To one simple portion, *owing to its environment*, are attached the words "a judgment," to another "a doubt," and to a third, "a volition," while those very words, or what at any time takes their place, are united secondarily with the accompaniments they refer to. [*Test.*] Besides, desires, emotions and volitions are complexes and not primitive systems, for, as we have seen (sec. 71), even sensations are not that: they are feelings of an indifferent nature attached to certain percepts and ideas, and they are interpreted in the light of the processes with which they are connected. Hence we meet a systematic succession of systems and no more. Desires, volitions and thoughts, regarded either as pre-membered or re-membered, sensed or imaged, form no separate category in the scheme of things. Nor can secondary systems be distinguished fundamentally from primary systems (sec. 181).

171.—MIND AND BODY.

We are now able to deal with a long list of problems of a peculiar nature. First, as to the disparateness between mind and body. A certain change in the nervous system is said to run parallel with a change in the visual field, the former of which is looked upon as physical, and the latter as psychical. Yet here the opposition is superficial. What is the central nervous system but an exhausted visual and touch system? What meaning, then, is to be attached to the contention that the one differs in kind from the other? Strictly speaking, we picture now one thing—a house, and now another—a volume of white and grey matter called brain, both being sights.[*] The seen house is not inside the seen head; they are two independent visual systems, and, for that very reason, no looking into the one could show us the other. Accordingly, the whole problem we are dealing with has been in some quarters attacked in the wrong way. A special set of reactions which can be followed in great detail, has been ranged in opposition to a random set of reactions, the latter being named mental and the former physical. As a matter of fact, it is only *a question of emphasis, an artificial isolation, a derived opposition.* Looking at the matter as students, we must demand the demolition of these practical, artificial and derived distinctions. The body seen and the body thought-of are visually of one substance, the eye itself being a visual compound.

It may be argued that by the nervous system is meant the *reality* which underlies the *appearance* of the nervous system. This, however, does not affect our problem, for as against the *real* brain, we should then have a *real* house or a *real* sun. In other words, if we regard the brain as an exhausted system, we must look upon the world generally as exhausted. Hence the body is one exhausted system among many.

172.—MIND AND MATTER.

The exhausted primary or object world is supposed to be material, while the secondary or memory world is said to be immaterial: but this illusive contrast springs from the same source of error that was exposed in the last section. The artificial contrast, too, is heightened by an additional factor, since when we think of matter, we arbitrarily select certain features of sight systems and resistance systems (or only resistance systems) and leave everything else out of consideration.[†] Physical science has in this way abstracted from existence all but grey resisting particles.[‡] To this procedure there can be no objection so long as the artificial barriers are not represented as insuperable ones. We consequently see no reason why these grey resistance points which are thought of by scientists when they interpret sound, light and other sensations, should in the final analysis be cut off from the total of systems. It is true that a bell, as far as seen, has no sound, but neither can a bell, as far as heard, be seen. Thus the one complex like the other possesses no claim to be isolated, except for practical purposes. It is conceivable, as we shall see in sec. 189, that the sense of hearing may become as delicately developed as the sense of sight is now, while, at the same time, we can imagine a sense of sight as backward as is now the sense of hearing. In the latter case hearing and resistance feelings would constitute matter, while sight would be regarded as a subjective appendage. Matter, memory and thinking, therefore, form one plane.* As Mach (*Empfindungen*, 1886, p. 5) says: "Thing, body, matter is nothing outside the complex of colours, sounds, etc.; nothing outside its so-called marks."

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[*] The prevalent dualism is well exemplified when men regard an image, a memory picture, as being utterly distinct from its primary counterpart, and imagine the former alone to be immaterial and to occupy no space. According to our interpretation both systems are alike sights (or contacts), and both have the same qualities and substantive attributes.

[†] See Heinrich, *Die Principienfrage in der Psychologie,* 1899.

[‡] I speak of *grey* resisting particles as indicating particles as seen. As we shall see further on (sec. 182a), the world is to us essentially a visual system.

Ordinary reflection tends to divide *resistance feelings* from the *thing* which resists. To "common sense" an identification of the two appears like a violation of thought. Yet this seeming separation has no solid foundation. Negatively this is perhaps readily seen. Assuming the existence of only one class of systems, that of touch, and granting that we ignore the past and present acquisitions of that sense, we find that the word thing or matter has no meaning whatever left, not even the significance of an undetermined *x*. Usually we avoid such a conclusion by surreptitiously interpreting the present in the light of the past, and that is the portion of truth embodied in present-day theories; but given a being only capable of touch, and a little reflection will convince such a being that the word matter or thing can have no other possible meaning to him than that of a combination of touch systems.

Experiment yields the same results. With eyes closed we pick up some object, handle it for a little while, and finally pronounce it to be a sea shell. What we meet here is a series of touch, pressure and resistance feelings, and, apart from memories of other like reactions, nothing else. What appears to discount the immediate feelings is that the notion of such an object as a sea-shell links itself to a vast mass of accumulated stores where what is primarily given at any time is but an insignificant portion of the whole. In this way the present tends to be dissociated from the larger mass of past reactions, and men construct in the darkness a *thing* or an *object* which, in their opinion, is something different from the tangle of touch combinations with which they have become abundantly familiar. At least, experimentally inquiring into the meaning of matter, weight, size, shape, space, motion, change, —as far as touch is concerned,—it becomes intelligible how *the things-we-touch* are *systems-of-touches*, and how, through the far-reaching complexity of the problem, men have become confused, and instituted a fresh category of *things-apart-from-feelings, i.e.*, of feelings behind feelings. [*Experimentally verify.*]

We conclude, then, both from negative and positive considerations, that touch systems are of the same order as sight systems: and this strengthens the conclusion that the problem of mind and matter, of spiritualism and materialism, arises out of a misreading of the facts. Apart from such a misreading, matter and mind, as ordinarily conceived, are impossible entities.

Prof Ward (*Naturalism and Agnosticism*, 1899, i, p. x) insists that "it is only in terms of mind that we can understand the unity, activity, and regularity that nature presents." His proof of that position is far from cogent. He minutely criticises the imperfections of physical theories, and at the same time boldly assumes the absolute correctness of the random guesses which go by the name of psychology. It seems, indeed, bold for Prof. Ward to attack the physical theories which are at least based on laborious research and not on arm-chair speculation; and were it not for brilliant style and great learning, the thesis which he seeks to support would not be taken seriously by anybody. In addition, he ignores the fact that his criticisms are commonplaces among physicists, and that there are a number of other solutions besides his own in the field. While this work has nothing to do with either Naturalism or Agnosticism, I emphatically hold that present-day psychology, being yet in a pre-scientific stage, cannot offer a sound criticism of physical theories from its own standpoint.

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* If this be so, Clifford's contention that "the universe consists entirely of mind-stuff" (*Lectures*, 1886, p. 286) must be dismissed. Du Bois-Reymond's celebrated *Ignorabimus*, based on nothing but the impossibility of reconciling the current superficial views of matter and mind (*Die Grenzen des Naturerkennens* and *Die Sieben Weltrathsel*, in his *Reden*, 1886-7), must also be discounted. Nor can we agree with Ziehen who says: "Everything which is presented to consciousness, and only that, is psychical. Physical is that part which we place in space and time as the cause of our sensations" (*Leitfaden*, 1891, p. 3).

173.—FORCE.

A certain *seen* stone approaches a certain *seen* pane of glass, and the glass is in the sequel divided into flying bits. For aught I know theoretically, the stone might have simply dived through the glass or been shattered itself. Consistently observing certain effects of motions and certain connected sequences, we give a name to them, the name of force. That word means neither less nor more than the result of our observation, except that in human beings certain otherwise indifferent feelings go along with strenuous muscular activity (sec. 166). This striking and constant effect of movements when objects meet, interpreted in the light of muscular feelings, has been unjustifiably elevated to the dignity of a third substance. If we ask why the approaching visual stone should be followed by the disintegration of the visual glass, we can only answer, as in all other cases, that it is so as a general fact, and that it conceivably might be otherwise. Hence modern science is, rightly enough, abolishing the notion of force. Energy, its creation, conservation, transformation and destruction, except as a matter of theoretical formulation, expresses only pseudo-science which is eager to multiply substances. All that we note in observation is certain recurring events when varying masses approach each other with varying velocities, and science can but state what takes place (sec. 187). These mass motions happen to be calculable; but, as for conjectures, they might or might not be reducible to rule.

On the notions of Force, Motion, Cause and Necessity, see especially Stricker, *Bewegungsvorstellungen*, 1882.

174.—MOTION.

The conception of motion, like that of force, is one which practical interests have raised into prominence, motion being, of course, noticeable in imaging as in sensing (sec. 120a). It expresses, visually, certain changes in the field of sight; for example, when something covers successively certain points in a straight and extended line of vision, we speak of that something coming near or disappearing in the distance; or, again, when something can only be continuously observed if the eyes or the head are in motion, we consider that a system is changing its position. [*Verify this*] Such changes, we call motion. Hence when horses are approaching us from a distance, we see movement of head and limbs, but forward motion we see only when something in the environment *visibly* changes.

The nature of imaged motion is dealt with in sec. 120a. References to the "sense" of motion will be found in all larger works on physiology, and the subject is also discussed in Mach's *Bewegungsempfindungen*, 1875. The general opinion seems to be that the semicircular canals are responsible for the "sense" of motion.

175.—APPEARANCE AND REALITY.

Owing to speculative interests and to the absence of scientific inquiry, this problem is as yet far from solved. Encouraged by the fictitious contrast between mind and body, the Kantian theory took shape, holding that the mind could only apprehend things as they *appeared* to it, and that all we could know were appearances or phenomena. We could not, it was argued, slip out of ourselves, doff our own skin, so as to appreciate things in themselves, and hence the ultimate reality or proximate reality was for ever hidden from us. Kant's special object was to show that it is demonstrably impossible to be cognisant of more than appearances or phenomena.

If our analysis has been correct thus far, the Kantian position is untenable. If self and not-self be one, as we shall learn, what room is there for appearances? The semicircular slice of ocean which I see before me at this moment, is a fact, a simple fact, a bare fact; the boom of its waves is another bare fact; and the taste of its water another. They are not different aspects [*what is an aspect?*]; they are different facts. They are realities, if there be any meaning in the word. If there were an entity, *X*, which was in contact with things, *not-X's*, then, between them, there might be some misunderstanding. This, however, is not our interpretation of the data. The swollen sea *is*, not to *me*, but *is*. Next moment, its green has turned to blue; and then there *is* a blue sea. No elaboration can go behind these facts. We may, for the sake of consistency, be compelled to postulate some other knowable or unknowable existence to account for this world; but then the other world would be but another reality. The things we know, are things in themselves, or else they are no-things. The distinction between appearance and reality, between phenomenon and noumenon, is one referring to practical interests. We may look at the sea, first with our own unaided eyes, and afterwards with coloured glasses, and say that the former is reality, the latter appearance. In the final issue they both represent final realities. For this reason, if, up to a certain period, we had always seen a thing through coloured glasses, and then saw it without them, the former views would not be in any sense less real.

An acquaintance tells me that when he was a boy he used to prefer landscape pictures to real landscapes, and for this reason he went more frequently to picture galleries than to the country. Later, finding that his eye-sight was defective, he procured suitable glasses, as a consequence of which he discovered that nature was far more beautiful than he had anticipated. He was now born into a new world, and visited the country haunts which he had hitherto scorned. Both these visual worlds, according to our interpretation, are equally real. Unfamiliarity, again, is frequently responsible for an original view of things. A girl of seventeen, approaching the sea for the first time, looked upon it as a vast volume of mist rising from the ground, while a girl of about six, seeing a boat some distance out at sea and the sailors busy with the sails, mistook the boat and the sailors for a marvellous working model of a boat.

Whatever turn we give to the argument, in a world consisting of one plane, there can only be realities, underlying substances meaning, at best, other substances. Hence we dismiss the problem of Appearance and Reality as being based on a radical misreading of the data.

The facts on which our conclusions are based are in part well stated by James: "Some of these qualities, since they are more constant, interesting, or practically important, we regard as essential constituents of the thing. In a general way, such are the tangible shape, size, mass, etc. Other properties, being more fluctuating, we regard as more or less accidental or inessential. We call the former qualities the reality, the latter its appearances" (*Psychology*, 1890, ii, p. 78).

The words "Appearance" and "Reality" are popularly employed to emphasise a homely distinction. Thus we say that a man has the "appearance" of being intelligent or gentle, but that in "reality" he is not. Here appearance means a *surface reality* which suggests, through familiarity, a *more permanent reality.* The ordinary man would not deny that the appearance is real, and it is difficult to see how any one could reasonably deny that that was the case. For the same reason "common sense" would define a reality to be an appearance about which there was no doubt, *e.g.*, he who appears gentle in thought, word and deed, is in reality so. Popular usage, therefore, recognises no sharp distinction which would rob appearance of its reality or reality of its appearance; and it has yet to be shown that the distinction can be maintained scientifically and philosophically.[*]

176. The Self.

In ch. 4 it was shown that the process of satisfying a secondary need is one of gradual elaboration and development. The notion of self, therefore, cannot be of all pervading importance, as is the atmosphere to a flying bird. We have learnt already (sec. 69) that a notion is definable not by immediate content, but by possible development, and hence we deduce that the assumption of the constant presence of self in the form of an idea assists little in its interpretation.

Let us now face the meaning of the words of which "I" is the best representative (sec. 163). In insanity it is not infrequent for an individual to be fitted out with two or more selves; let us say, with the normal self and with an abnormal self. These selves indicate that at different times different centres attract and sort the matter of observation and thought. In this way different abilities, different departments of knowledge and different temperaments gradually develop—as in two unrelated children—considerably widening the already existing breach. Psychologically this is but a branching off of secondary complications, a process which, in theory, is unlimited. Mental derangement, then, introduces the first doubt as to the generally accepted meaning of "I."

Insanity is but sanity exaggerated in some direction. Among the sane, accordingly, the majority have no supreme principle to which the whole of their life does obeisance. In politics, for instance, a man may be dull, slow, oversubtle, blind, prejudiced, a self-deceiver; while in business the same individual may be the opposite: keen, quick, penetrating, clear, impartial and a self-observer. Yet the co-existence of these two trends, removed from one another like two rivers which never meet, is usually not even suspected by the individual who generally thinks that he is pursuing one consistent course.

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[*] "... appearances exist. That is absolutely certain, and to deny it is nonsense. And whatever exists must belong to reality" (Bradley, *Appearance and Reality*, 1897, p. 122).

Furthermore, what is true of large interests, is true generally. We have innumerable principles of action for different circumstances, each of which calls itself "I." We are continually changing the signification of the word when we use the first personal pronoun, and if any one else had to define for us its various meanings, he would be sadly perplexed. To our superiors we are deferential, to our inferiors condescending, to children patronising, to our family affectionate, to mankind indifferent; in some respects sympathetic and in others callous. In this way, also, our many habits reveal almost as many characters (sec. 65a).

Now since inefficiency drives deathwards, confusion and insanity have their rigorous limits. Hence needs will more or less have one centre around which to turn, and consequently self-reference, reference to incidents connected and to be connected with the deeper needs of the organism, is naturally of frequent occurrence. Accordingly the ideal man would be one who used the word "I" unequivocally: he would be one perfect organism. However, the very nature of the flow of thought rules that no unnecessary reference should at any time occur, and, in consequence, we find that, inspecting concrete stretches of thought, our key-word or its equivalent, is generally absent. Even where it is frequently employed, as for descriptive purposes, the word, like a quick-change artist, possesses no permanent features, but only appears in varying complexes, as it has appeared before. Indeed, fundamentally it is but one of a host of systems, such as those of time and space, which constantly recur or develop, and the context supplies its significance at any time. We have not, then, some great shadow in perpetual attendance, but a word with no exclusive connotation.

We must, therefore, reject the easy assumption that because a certain word is frequently employed, its meaning always remains the same. Looking back upon our own thought, we observe no Subject, like an admiral on the bridge of his flagship, dictating and controlling, some man above the man or in the man; we only note a process of development which requires no such assumption. Arduous examination finds no immaterial Subject which is mysteriously affected and spontaneously affects other things; it only meets with a single plane without any unanalysable entities. A contentless Subject, or one not analysable into elements like any other thing, is neither more nor less than a pre-scientific conception. In its place we must put the theory of developing complications (or associations) where the importance and meaning of the word "I" is casual and ephemeral.

Again. Needs gradually and systematically change from birth to death. For this reason the longings for boisterous play, for adventure, for courtship or for strenuous endeavour, are no accidental suggestions of an ego. On the contrary, the individual, the "I," but reflects or expresses these developing longings based on changing needs. We only imagine that we have been born, as an inference from general observation, and we are greater strangers to the younger self of three years old than to any chance passer-by who is about the same age as ourselves. Similarly, the staidness of old age can only with difficulty be compared with the romping nature of youth. In the truest sense, therefore, every great change which we undergo, and we undergo many of these during a lifetime, creates a new self, the old self bearing almost the same relation to us at any time as the cast-off skin to the emerging snake. It is as if a succession of individuals had occupied a certain tenement called a body, and as if we felt bound by courtesy to ignore the differences in the tenants. As a matter of science, however, we have, on the non-bodily plane, a number of individuals coinciding with the most important stages between infancy and senility.*

In the visual universe, organisms represent unmistakable landmarks which can no more be safely ignored than walls or pits; and these organisms have histories. The organism that re-appears most, we refer to as "I"; or if we include what runs parallel with that organism's visual existence—smells, fears, and trains of various systems the word "I" has some other centre, not however unrelated to the seen organism. Hence "I" and "you" have distinct meanings without implying anything definite as to phenomena and noumena, appearances and realities. We have already seen, accordingly, that the nature of self represents no stable existence, quality or size. The problem before us is not to be solved by those who assume that words can only be used in one sense.†

170a. The Nature of Mind.

The point of view adopted in this work has been strictly analytical. That is to say, to employ our terminology, we have reduced exhausted systems to unexhausted ones. Hence the body as well as the mind and the world have been analysed out of existence, as water is analysed away into oxygen and hydrogen, leaving it to a synthetic treatment to reconstruct them. With regard to physics this reconstruction is unnecessary here; but we will try in this place to understand the meaning of the word Mind.

If we look closely into the matter, we shall probably find that the several senses do not express the one world in so many separate terms, as if, for instance, colour were another form of touch. At first sight the position which we are criticising appears plausible, since we may imagine that with each sense *perfect*, each sense would give precisely what the other gives, only in terms of its own. In that case we should be confronted with several different worlds, each, in a sense, a copy of the other; and we should wonder why one world, interpreted in one sense, does not suffice. The inadequacy of this plausible theory may be illustrated as follows. If we take the senses as viewed from the "physical" standpoint, the supposed equivalents of sound, sight, touch or smell (air waves, ether waves, contact, or loose smell particles) may be imagined as developed to perfection, the sense of smell, for example, yielding a prodigious quantity of detail. Nevertheless the chasm between the different senses would remain precisely as wide as ever. The differences would be such as are implied in the differences between air waves and ether waves (compare sound with sight), in objects being directly in contact or only through loose particles (compare touch with smell), and in specific processes (compare the differences in the structures of the various sense organs). Here, then, we have suggested not one identical world expressed in several different terms, nor several worlds expressed in several terms; but one world composed, so to speak, of so many parts, corresponding to the various stimuli which affect the various senses. For this reason, the knowledge gained by one sense cannot possibly tell us what the other senses disclose, except it be by inference based on wide study; and for this same reason, the parallelistic and the pluralistic conceptions must be dispensed with or re-interpreted.

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* As far as the memory of our past is perfect and influences us, so far does our whole life present a single individuality. Where the memory, however, is very imperfect, as it normally is, and where fresh influences rule, as they usually do, there we ought to speak of successive individualities. Else, if we press the argument, we shall have to acknowledge that our individuality belongs to the parents from whom we descend, and so on.

† The above analysis of the self agrees, I find, substantially with that of Mach's in the first chapter of his *Beitrage*, 1886. See also Bradley (*Appearance and Reality*, 1897) on the self.

Reasoning along this line, we are enabled to question another plausible doctrine. It may be said, for example, that the several sense worlds are one; that is to say, that different senses refer only to different degrees of complexity in sensory development, in which case, supposing sight to be the highest sense, all the other senses, if sufficiently developed, would become identical with the sense of sight. Against this one must contend that perfecting each of the sense organs separately and on its own basis, like perfecting various machines each of which has a different object, brings the different senses no nearer, though fundamentally this does not exclude all "sensory" matter like all "physical" matter from being one.

We now go a step farther, and imagine the world as a distinctionless continuum capable of development in many directions, just as the physicist imagines his physical world to be. We now obtain the possibility of many unexhausted and exhausted systems. One of these systems regarded as exhausted we speak of as the body, another as the mind. How are we to picture to ourselves the latter, assuming its existence? The following tentative reply may be given. In his first stage we imagine the individual as a feeling germ or germ of feeling, similar to the tactile or visual biological germ out of which the "physical" organism develops. That germ of feeling is almost homogeneous at the commencement; it develops very slowly compared with the biological germ as exhausted; and the line of development follows the line of nervous development. Given that the feeling germ (like the physiological cell) has an environment, and interaction will ensue, as a consequence of which the feeling germ (like the physiological cell) will grow and be modified. At last, mind, like body, is but a remote chance. Conditions favouring, that feeling becomes in time more and more systematically differentiated, reacting differently to different circumstances; for example, the adult meets one remark with doubt and another with belief. In the body as exhausted we have a *complex, persisting* and *permanently modified* system. What is to match these characteristics in the mind as exhausted? We answer that we have to regard the feeling germ as growing in complexity and as being permanently modified, though the mind as immediately given shows no sensible trace, and though insight into its structure is yet a problem reserved for future generations. We need not imagine this mental tissue as closely corresponding to that of the organism, for much of the organism's work is extra mental. We must, however, imagine it as persisting and becoming well defined or ill defined according to the vigour of its activity. As with the body, we shall have to judge of its reality and life by its behaviour rather than by its more passive states, since the mind, for all intents and purposes, like many parts of the body to which it corresponds, is dead in deep sleep. So is it with the mind generally. Its existence for the observer lies essentially in its activity, and in so far as we abstract from that, to that extent the mind loses its characteristics.

We have to imagine the mind's activity as we do the activity of the body. Owing to special environment and original endowment, every feeling germ will develop to some extent differently. We note the fixed variety of ways in which the mind responds to primary and secondary stimuli—to emerging sensations and emerging thoughts—and judge accordingly. In agreement with the nature of the response we speak of individual hope, fear, doubt, belief, passion, intelligence, resolution, obstinacy, kindness or justice, and the bare *states* of feeling are interpreted by the general mental context as given by wide knowledge. In this tissue of feeling, as it changes, we have the individual mind. The general antecedents of mental action, or the propelling forces, also resemble only in some portions the physical antecedents of action. To represent hunger, thirst, doubt, joy, pain, we have feelings which show little individuality as compared with the accompanying physiological changes; but these feelings, too, only disappear after a certain course of activity, *e.g.*, the feeling of hunger disappears after eating. For the mind these, and not the stomach or the heart, are the concrete springs of thought and action. Thus, too, according to the form which processes assume, we speak of doubting, thinking, hoping and acting.

Leaving aside action, it is not easy to discover the features which mark off an individual mind from the world which surrounds it. Foremost in fixing the nature of mind we have perhaps the feelings of hunger, doubt, etc., and the general methods of response to *varying* and *unvarying* circumstances, as in deliberate and reflex action; though even among these factors certain inclinations or tendencies frequently take the lead and determine other possible courses of action to a very considerable degree. Again, all that is given secondarily, *i.e.*, in the memory,—especially if elaborated by the imagination, is considered part of the self as exhausted. Accordingly, since our thoughts and our speech and action are but re-elaborated memories, they form constituent parts in our notion of the nature of an individual, and, therefore, that which is primarily given, is, by contrast, regarded as extra-mental. The body, also, especially in so far as it is connected with feelings, forms part of the mind or self. Everything else, therefore, as other bodies, things or minds, is excluded from the notion of an individual mind. In retrospect, too, the developed images represent the mind's past.

Since the self resembles the organism, its points of view will be organic. Hence as the needs are connected in one interacting whole, each need represents the self more or less completely; and consequently the man as a whole speaks in every need determined action. To imagine the man as being placed behind this unfolded feeling-germ, is, as we have said before, to assume a mind behind a mind. To assert that the mind, like a showman with his marionettes, sits behind a curtain and directs the play, determines what to do, and carries out plans, is merely to trifle with and to exasperate the searcher after truth. For my part I prefer a conception of mind which shall be in harmony with facts rather than one which merely coincides with some favourite theory.

If the reasoning in the last paragraph be correct, then it follows that changes in individuality are to be expected. Just as the body remains essentially the same in the child as in the man, in the uneducated person as in the educated one, in habit as in reflection, in insanity as in sanity, so does the mental tissue. Could we examine the latter, we should find that strict continuity was not wanting. However, as the living mind is to us fundamentally the active mind, we must allow for the radical transformations therein observable.

Reviewing what has been put forward in these remarks on the nature of mind, it must be evident that, necessary as some such notion must be, the absence of a *traceable* mind organism, and the fact that that organism is regarded as exhausted, made it imperative to build psychology on a soil that shall not be constantly subsiding, rising and shifting. I have, therefore, rejected the individualistic standpoint in psychology; and I have made no pretence to a philosophic treatment, the grace and smoothness of which are usually obtained by an extensive sub-editing of facts.

177.—PRESENTATIONS.

With the Subject hypothesis is connected the presentational theory. Objects were thought of as being placed before, or presented to, a mysterious something called consciousness, and those presentations were imagined as passive clay moulded into shape by Subjective Activity. Such a view is as unprofitable as it is unwarranted. In the final analysis there is no Subject and there are no Presentations; there are only systems of one kind, all happenings being *per se* (sec. 80).

Note that the word Presentation is absent from our psychological vocabulary, and also that its meaning implies a spatial factor.

178.—INNER AND OUTER.

"Inside the skin" and "outside the skin" embody a fair distinction. As the soul was supposed to feel in the body and through the body, secondary and primary systems were referred respectively to the soul and to the world. With a slight advance in discrimination this interpretation was discovered to be a mistake, for the body, like the world, it was contended, was material, while the soul was neither material nor spatial. Hence inner and outer have now come to mean spiritual and material, and the eternal self is regarded as that portion which at any time forms the core of individual existence. In accordance with the previous analysis we can, of course, accept neither the older nor the more recent distinctions. To us there is but one world.

179.—EXPERIENCE.

A plain word such as Experience should scarcely need any comment. It seems unambiguous enough. Yet philosophers have spoken about it in subdued tones and with bated breath. No one can deny experience, they argued; but experience implies a supernormal Subject; hence experience proves that there are Subjects. Now if experience be something which has only to do with Subjects, then I do not know what it implies. I take experience essentially to mean that which happens to anything, stone, tree or man. Or if the word is to be restricted to highly organised beings, then experience would mean a developed form of undergoing or happening. In this sense, whatever happens— the simplest system or the most complex—forms an experience.

The above criticism is written with special reference to Prof. Ward's *Naturalism and Agnosticism*. As the word Experience has a number of meanings attached to it, I have rejected it from my psychological vocabulary.

180.—PSYCHOPHYSICAL PARALLELISM.

The doctrine of psychophysical parallelism is supposed to express one of the great truths wrested from nature. It asserts that every portion in the secondary series has a physical counterpart in the nervous system and *vice versa*, that is to say, everything nervous or mediate has its mental or immediate correlate, and everything mental or immediate its nervous or mediate correlate. Nothing could be more inconsistent with our data—leaving aside fundamental assumptions—than such a theory. For instance, the complex and manifold processes, from the arrival of sight stimuli to the development of a visual system—consider only the enormously complicated structure of the eye—which give the physical explanation its value, are not at all represented on the supposed non-bodily plane. It is allowed, in like manner, that the bodily processes which intervene between the desire to move and the movement itself, a highly intricate series, are unrepresented on the non-bodily plane, and here, therefore, the parallelism is again absent. In a similar way, the processes implied in the "association of ideas," as well as the nature of retention, are generally recognised as being traceable physically while unrepresented in the non-physical series. So, also, the majority of the feelings must be taken as but poor parallels to their physical counterparts. When we come to needs, we are again faced by the same fact that the inarticulate feelings, like hunger, etc., which correspond to them are very poor equivalents of the inherited complex organic tendencies, and that a parallel to the mass of systems which make up the body—nerves, muscles, blood, etc.—is entirely wanting. So it is with the process of satisfying a need as represented by nervous elaboration. While the latter is immensely involved, the former shows an insignificant medley or concourse of vague feelings and few distinct images. [*Test the above step by step.*] Under these circumstances one fails to see the usefulness of the theory, and one cannot conceive that anything but speculative necessities could have evolved so monstrous a comparison. If we consider physiological researches, we have something like a complete scheme accounting for human activity; but if we regard the non-physiological portion, all coherency vanishes, and things happen in a most unaccountable fashion, as far as human activity is concerned. As Clark Murray (*Handbook*, 1885, p. 407) well says: "Apart from anatomical study, muscular sensation can no more reveal the structure, or even the existence, of muscles than a sound can tell the form of the cochlea, or a colour can reveal the rods and cones of the retina."

What is false in practice, is no truer in theory. The movements in the lingual apparatus, which are supposed to run parallel with the vocal sounds uttered at the time, are merely facts of the same order as the sounds. Both sets of occurrences can with equal propriety or impropriety be entitled mental or material. The lingual movements, whether considered as sights or resistance feelings, are but primary systems, and the same must be said of the sounds; thus to say *the thing sounds* is as correct as to say *the thing resists*. Hence psycho-physical parallelism is a delusion, for there are two sets of facts of the same order, and these only touch at some points. The probable reason of the apparent parallelism we shall learn later (sec. 189). Meanwhile we need only notice that the parallelism or concomitance is such as we find, for instance, between usefulness and pleasantness, and is owing to the presence of a central need from which a large number of lines radiate.

The nature of parallelism may be illustrated as follows: whenever we *see* the bell-hammer touch the sides of the bell, a sound is *heard*, and the loudness of this sound corresponds to the violence with which the hammer is seen to move. So also the hands on a watch dial move parallel with the works inside the watch, as when on turning the watch key, the hands on the dial move. Here there is a known connection accompanying the parallelism. [*Give other parallels.*] So also is it with the brain and anything seen. "If while one watches 'the lark soaring and singing in the blinding sky,' the other peers into his head as he watches" (Ward, *Naturalism and Agnosticism*, 1899, ii, p. 12), the parallelism lies in the brain movements observed by the latter, which vary directly with the pictures observed by the former. It is as if we followed the hurrying rain-clouds by noting their reflections in a lake, or told the want of rain by the cracked and crumbled soil.*

181.—MEMORY.

If reactions left no more traces behind than clouds passing above the sea which they momentarily darken, all comprehensive statements would be impossible. Certainly, the assumption underlying all I have said or all we can say is that of the existence of a memory. It is, therefore, necessary to recapitulate the general conclusions on the subject. Comparing primary systems with secondary ones, we note the following characteristics: The pre-membered system or, as we may call it, the *uncontrollable* system, (1) can be fixed for a long time; (2) is almost inexhaustible as regards fresh detail; (3) has an environment; and (4) appears generally definite in outline. The re-membered system or, as we may call it, the *controllable* system, more or less lacks the above signs; and in so far as it approaches these by itself, it tends to be confounded with the uncontrollable system or sensation. That is to say, the image (1) can only be fixed for a short time; (2) is soon exhausted as to detail; (3) shows but the barest suggestion of an environment; and (4) is vague and indistinct.

The above characteristics, however, do not touch the kernel of the memory problem, for it is easy to imagine these distinctions abolished without any confusion arising between primary and secondary systems. The fundamental difference lies in the fact that the systems are given in a series, and that position in a series indicates primary and secondary systems. We have complications which emphasise the distinction: we say "This happened yesterday," because that phrase is secondarily attached to the imaged event. If, then, a view fits in at one end—the to-day end—we call it primary; but in proportion as it falls into the scheme called yesterday, last year, or twenty years ago, so we call it secondary. Position in a series is, then, the final distinction which divides past from present (sec. 124).

Lastly, we are compelled to believe that this series is its own explanation, since systems are not seldom ranged in the wrong portion of the series without our suspecting the error. In insanity the positions may be fatally mixed, and in sanity there is only a probability that any particular fact is occupying its rightful place. Hence the trustworthiness of memory can only be tested by further appeals to the memory, a proceeding which has no theoretical significance.†

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* Heymans, *Zur Parallelismusfrage*, 1898; and Wundt, *Ueber psychische Causalität*, 1894.

† See Ward, *Naturalism and Agnosticism*, 1899, pp. 156-9.

182.—SPACE.

On account of some fanciful freak of fashion the nature of space has played an important part in speculative inquiries, and for this reason, the attribute of space is employed by writers to separate matter from mind. "The object world," says Bain, "is distinguished by the property called extension . . . The subject world is our experience of everything not extended . . . a pleasure, a volition, a thought, are facts of the subject world, or mind proper" (*Senses and Intellect*, 1894, p. 1). "All phenomena of the external world," writes Sully, "are phenomena in space, and have the space-attributes of position and extension. The phenomena of the internal world are said to be in time only, and not in space; or, in other words, to be unextended" (*Human Mind*, 1892, i, p. 7). Such being the contention, we shall analyse the notion of space in detail. taking visual systems for our basis of discussion.

The first thing we notice is the narrow range of vision. We think that we see a great deal at a glance; but that is only because inference usually fills out the spots left vacant by observation. A simple experiment will illustrate the above. Take the following row of figures

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which in itself occupies little space. [*Examine the row of figures upside down.*] If the eye is fixed on the first figure for the first time, any figure after the fifth or sixth figure ceases to be distinguised; if on one in the centre, the result is similar. This experiment makes it evident that little is seen at a glance, however much this may seem to be contradicted by what we know. Take again the word *undenominationally*. [*Examine the word upside down.*] Here it is easy to imagine that we do see the word as a whole, yet if we place a thin point before the *y* or above the second *a* these points remain unseen if our eyes are fixed on the first letter. (Or take the word *Aufmerksamkeitsschwankungen.*) Clearly, we are able to observe at a glance very few details, inference continually coming to our assistance. We casually look down the road, and a great deal appears to develop; but if we examine our memory, we find that we have attended to, or there have developed, only broad and vague outlines. In proportion as we wish for additional material, so we restrict the immediate scope of vision. A glance out of my window as I write reveals half a town, but continued observation of parts of the field of sight yields ever unsuspected detail. What is seen is eked out by what is inferred, and is indeed almost entirely made up of inferences. [*Test.*] In addition we must not forget that all so-called sensations are after-sensations (sec. 19).

The suggested size of objects is largely a matter of inference. Looking through the hollow of my nearly-closed fist at the silver bridge which the moon has built right before me across the sea, the vast expanse shrivels into a very little space. [*Note generally the effect on size when one eye alone is used.*] Thus the large steamer far out at sea is but an inch or two in length when measured by its appearance. So in the seemingly extensive panorama revealed through a pane of glass we notice that the stately windows some hundreds of yards away appear but an inch high. Again, the conspicuous letters of the sign-boards in the distance are very small when we measure them by comparison with the finger which we hold up for that purpose. What we see, therefore, is interpreted as to size by our knowledge of what it would look like at close quarters; or, more strictly, this happens in *the comparatively rare cases* when there is a need for interpretation. The visual size of things, at any time, varies from nothing upwards to the point of most convenient nearness, everything disappearing at a sufficient distance. Trees, which are really about the same size, when seen in a long avenue grow smaller or larger as we recede or advance. The tall factory chimney, far away, which by comparison still looks tall, occupies about one third of an inch in length in my view of it. So, too, a small pond may reflect a magnificent view. Strictly speaking, then, the *real* size of anything varies directly with the distance from which it is observed, a near view being no more real than a distant one. [*Experimentally test the matter of this paragraph.*]

The three-dimensional nature of space yields even more interesting results. The first great fact we learn is that distance can only be appreciated as, or is constituted by, a system of lines or surfaces. The sea, for instance, appears to touch the shore which I am approaching from the fields; while seen near by, from the edge of the cliff, the waves are 100 feet below. In a case like this, supposing the shore to be previously unknown, and I remember such a case, it would be impossible to say that it was not approximately at the sea level. Once more, I think I see a dark growth on a low bush within a few yards of me, but the dark spot proves, on closer inspection, to be a boat a mile or more out on the water; and in the same way a large vessel in the offing sails, as regards sight, across the mast top of a vessel in the harbour close by. Again, the water line of a vessel fairly near, seems higher than the breakers on the shore, while a boat farther out is apparently higher still. Finally, while from the position which I am occupying, the trunks of two lime trees look about fifty yards apart, their crowns apparently melt into one another. [*Experiment in the above direction.*]

It is a well known fact that snow-plains give no reliable indication of distance. Abercrombie refers to this; and Abbott (*Sight and Touch*, 1864, p. 43) says that "in the Alps, for example, a glacier which is some miles distant may (if there are no intervening signs of distance) seem only a few hundred yards off." Abbott learnedly argues in his book that the notion of space is due to sight and not to touch; but he makes no attempt to show what space or dimension consists in. Bailey (*Berkeley's Theory of Vision*, 1842) occupies an intermediate position, holding that sight develops independently of touch.

Let us, however, examine a crucial instance. I know a view where several sets of chimney stacks and the roof of some buildings occupy about the same level. Looking out of the window in the ordinary way, the many distances, owing to the traceable detail, are readily observable and measurable. Bending down, so that the bases of the stacks are hidden from sight, all that is seen equally touches the window sill, distance being wholly obliterated. This is even better demonstrated by an experiment. Let two or more similarly placed sets of chimney stacks be drawn on paper, the farthest being drawn largest and clearest. Then, by covering over the bases and the intervening surfaces, the farthest would be judged nearest, though all appeared in a line. Endlessly as the experiment may be varied, we learn that apart from inference through *perspective*, *distinctness* and *departure from normal size* (which are but an indifferent measure) depth is only recognised when represented by visual contours and surfaces. (See Lipps, *Studien*, 1885, p. 71.) Accordingly, we find that when we profess to see depth we member in a rapid survey,[*] a number of lines in relation, the result of which membering we call depth. *Uneducated sight*, as illustrated by infants, *knows accordingly nothing of depth and distance, nor of vertical and horizontal, for only by seeing things together, with just the lines necessary, are we provided with these notions. Depth-seeing is hence a complicated process where a number of visual details have to develop in relation.* [*Test the above contention.*]

From what is known of the eye, and by what can be established experimentally, it follows that for something to be seen, it must not be covered by an opaque body. Hence, since objects of vision must be parallel with the parallel-placed eyes, and since our eyes cannot move as freely as our hands, immediate sight supplies us only with a knowledge of opaque tactile *surfaces*. The third dimension, then, is indicated by additional complexity in what is visually given, and will be developed or not according to the visual possibilities existing at a given moment. Thus when we look at the sea through somewhat distant railings on a terrace, the visual conditions permit us only to see a perpendicular wall-like surface. So again, if we observe the sea from behind some trees, the horizon opposite only reaches some few feet up the tree trunks. Here, however, owing to familiar differentiation, the sea is seen as horizontal and the trees as perpendicular. Nevertheless the differences of plane, horizontal and perpendicular, are not given in what is developed, our perception of them being based on the common knowledge that the sea is large and trees are small. So if I consider the blade of grass before me to be something more than a green shadow, it is because the visual changes, due to a strong wind, show that the blade of grass does not behave like a shadow. Generally speaking, then, we speak of depth and distance when certain groupings show certain familiar characteristics. Apart from such familiarity we are, in certain cases, liable to be deceived, and assuming extreme unfamiliarity, as with an infant, nothing but a blur develops.

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[*] In all effective sight there is continual movement of the eyes. Without such continual movement very little can be seen, and hence the resting eyes have little sense of space. Some authors contend that the muscular strain in eye movements measures the space.

Taking, therefore, the facts as they are, we cannot speak of two or three dimensions, or of dimensions at all, or of the plane of vision being perpendicular rather than horizontal, or *vice versa*. We have rather to do with visual distinctness and indistinctness, with familiar groupings and the like; and according to the features developed, so we speak of height, breadth and depth. In agreement with this, it is as unjustifiable to say that only a screen of colour is given to sight as that we only see depth. Both statements are relatively true and untrue, and what are called the three dimensions are simultaneously differentiated by the growing infant. When, therefore, we dissolve visual details, by nearly closing the eyes, the almost horizontal sea shore, as seen from the sea, and the perpendicular cliffs which bound it, or, under like circumstances, the floor and the walls of a room, readily form into one indefinable plane. [*Repeat the experiments.*]

We understand now how a smooth looking glass can, with absolute fidelity, represent the supposed three dimensions of space. Since depth consists of a systematic arrangement of lines, a mirror is able to display every kind of visual fact. Other classes of data equally confirm this view. A box drawn on paper in bare outline *irresistibly* suggests depth, and that solely because the lines, being drawn in relation, represent depth, as such. So, likewise, when a drawing now appears as a staircase and now as an overhanging wall (James, *Psychology*, 1890, i, p. 256), the strange transformation depends on the visual point of view we take of the lines present. When, again, a painting only remotely hints at depth, omitting here binocular vision, that is because the artist was either unable or did not care to insert those lines which fully suggest the third dimension. [*Determine the difference between seeing a picture with one eye and with both.*] The stereoscope, by supplying evident depth where only apparent depth was previously observed, is a seeming exception only, for in so far as certain lines are absent, the stereoscope will not show relief. The secret of this instrument lies in the character of binocular vision. Looking at any good picture, such as Marcus Stone's "In Love," with one eye only, we seem instantly to obtain a sense of depth which is almost one with the sense obtained from observing the scene it pictures. In the ordinary stereoscope advantage is taken of this fact of each eye exclusively emphasising certain lines, so that through the fusion of two slightly differing views, we obtain a sense of depth surpassing ordinary binocular vision (sec. 125). Yet even this exaggeration is wholly and solely a question of lines, a thoroughly bad photograph or picture necessarily appearing flat in monocular as in stereoscopic vision. Shadows illustrate the other extreme. Owing to the presence of but a single outline of one shade, or rather the omission of certain other lines, the three-dimensional view is changed into a purely two-dimensional one. [*Test all the above.*]

Strictly speaking, a photograph or a picture of anything three-dimensioned, is three-dimensioned as far as sight is concerned. To see the picture like a flat surface is next to impossible, and if this were our object and we attained it, we should see a blur and not a picture. Just as an exaggerated stereoscopic view betrays itself through its over-emphasis, so the ordinary picture tells its tale of presumed tactile flatness by under-emphasis of the third dimension as ordinarily seen. By a gradual disappearance of distinguishing lines, therefore, a retreating landscape slowly loses its pronounced tri-dimensional character, showing that the differences between dimensions are of degree and not of kind, while with a decrease of visual efficiency or an increase of darkness the same effect of dimensional obliteration will be produced. [*Test these last points.*]

Artificial distance is normally present, because things, to be seen properly, are usually observed from certain visual distances from the body. This theoretical inconvenience of artificial distance may be, with advantage, almost removed by looking with eyes nearly closed at the sharp angle formed by two walls. The vagueness resulting has here a double effect. Owing to the wiping out of distinct traces, depth is abolished, while the indistinctness of the total visual field places the flat view where the eyelashes are. Here all depth whatever is lost. [*Experiment.*]

We may add one word more as to the nature of seen depth. The most striking case which we can examine is certainly the view we gain when standing in the middle of a thoroughfare with high buildings bounding it right and left. Here, if anywhere, the three dimensions are to be met with; depth apparently stares us in the face, and the outlook seems the very opposite to that offered by a white-washed wall. Yet any good painting or mirrored reflexion of such a thoroughfare dispels this mistaken reasoning. We can see the frontages only in so far as they face us. Hence extremely little is seen of each house, which allows for a great many of them being seen before the field of sight is covered with them. Still, since we are well acquainted with buildings, every inch in the line of sight is recognised and clothed with meaning, *when necessary*. We know also that the little which we see will develop into much on our approach, and this possible material of vision is promptly thought of as actually present, which it is not. A single house which we face occupies as much visual space as a long array of simultaneously seen buildings, the difference being that in the latter case little is apprehended directly of each of the structures. It is by reason of the quantity of detail seen and inferred, that a straight avenue of trees seems to stretch to an interminable length before the two sides meet. Abolish the seen and inferred detail, and a blank wall remains. Precisely the same explanation accounts for the fact that the road does not seem to rise like a wall, the plentiful known detail being such as we connect with onward rather than with upward movement. Illusions as to depth or height might, therefore, be experimentally induced. Thus through some peculiarity of a bay at low tide, I thought that I was looking at hills and the sky beyond, when sand and water constituted the real scene. It is a matter for discussion how far the third dimension can be decomposed experimentally.

If we ignore the existence of visual depth, we have still the other two dimensions to explain; for the various forms which develop, spread out and up at various angles. That such complex vision is not unacquired, can be easily illustrated. Negatively we notice it in the instance of a bold sketch, where we say that we see a carriage when but a dozen strokes are traceable. Positively we see it in the puzzle-picture where one set of lines contains two sets of drawings. Here the obvious and well known figures confront us, while the other figures are hidden and must be searched for. Indeed, our visual education consists in finding details where none were previously suspected; while the specialist is one who sees much where others see little. However, a simple experiment strikingly exemplifies what is here contended for. I am looking at a full page reproduction in an illustrated paper, portraying about a dozen officers sitting round a long table on the South African veldt. Only two of these twelve sit on chairs, while the others are seated on boxes of all shapes and sizes. There is also on the farther side of the improvised dining-table a corrugated iron wall or partition. The scene as a whole unfolds itself at the first glance as though the eye mechanically and instantaneously assimilated the scheme. I now turn the picture upside down, when the whole scene vanishes and a confused patch alone is apparent. As I continue looking, I note how I hunt for lines and shapes, and how I eagerly follow up any scent on which I may have chanced. Discounting this development, the fact is plain that the scene owed its existence to familiarity, and that the absence of familiarity in the upside-down picture resulted in the blur which we have described. Two-dimensioned form and size, then, –ignoring hereditary predispositions,—are no more given than the third dimension. To trace a thing up or down, to the right or to the left, implies the apprehension of contours or outlines, and as a perfect blur has no contours or outlines, therefore all height and breadth dimensions are as artificially produced as the depth dimension. In the upside-down picture some contours existed, since the case chosen is scarcely an ideal one; but reflection seems to point to the fact that apart from visual activity or development there is no visual differentiation—no lines, no shapes,—in a word, no dimensional sight. This is not so strange, if we allow that seeing, like everything organic, forms a teleological process, and that hence nothing is seen apart from such process. In strictness, therefore, the two-dimensional field of vision, like the third dimension, is determined by what we have learnt in the past, those lines which seemingly point throughward being matched by others which seemingly point upwards and sideways. Thus possibly in agreement with sec. 189, all the three dimensions are equally constructions or rather developments, and this is borne out by the growth of intelligent vision in infants. [*Examine the question of two-dimensional vision.*]

If our surmise be correct, a conclusion follows which is of the utmost importance to us. The difference between the scene on the South African veldt and the reproduced photographic snapshot which reflects it, is great; but far greater still is the difference between the picture and the view gained by the simple method of turning it upside-down. In the latter case, vision scarcely exists, and in a perfect instance of this nature, the residue would resemble a throbbing ache or a tingling feeling, rather than fully developed sight. We seem, therefore, to be face to face here with the *matter* of vision, minus its subtle developments. If this be so, we have come to the parting of the ways where the sense of sight separates itself from, or unites with, its fellow senses.

When we see colour, we observe at least a uniform surface environed by other surfaces, from which it is differentiated by its special characteristics. If we exclude these other surfaces, we stare into nothingness and all colour is gone, or, at best, there remains only a vague feeling. [*Is that so?*] Closed eye vision, again, presents a changing multitude of dots, very like pricks on the skin, but even these dots are the result of a selective or complicated process. When this process does not take place, we have no volume and no dimensions left, but merely cutaneous feelings. [*Is this so?*] A shapeless cloud, a gust of wind, a swarm of bees, an indifferent form like that of a rock, may be regarded as having volume, but a strange medley of dots, as in dim closed eye vision, in no way resembles masses, volumes or lines. The undeveloped man, then, is blind, and lacks a colour sense and space sense, the former sense, like the latter, arising from development. By organised attempts the chaos is reduced to cosmos, and this is done by systematically developing visual systems, singling out in this way portions of the chaos and creating points, lines, surfaces and volumes. Space, strictly speaking, has no dimension. We have only a complex of lines, or changes in the field of visual development to our attention. By persistent changes that field becomes gradually exhausted, and with [illegible] space. Hence space, as we know it, is all the space possible.

We speak, indeed, of three dimensions, *i.e.*, height, breadth, thickness, as if space could, like a triangle made of three sticks, be divided into three parts. Forming the three lines meeting in one point at right angles to one another [*construct such lines*], would convey no meaning of our space to any one who had been acquainted with only these three lines. The notion of a point, of breadth, of crookedness, of form, that is to say, of space as it is given, would be hidden from him. He would know those three lines and nothing beside. Any added line, say one at an angle of 45°, or any thickening of the lines, would open a new world to him. To the normal adult there exists an indefinite number of lines, points, shapes and directions. If he sums these up in a formula, that is merely for convenience.

The fact that space is regarded as tri-dimensional has suggested a mountain of absurdities to those who have not asked themselves the pertinent question as to what is the nature of space. It is as though it were said that since a perpendicular line may be drawn in *two* directions—up or down, therefore there could be in such a line three, or four, or more directions, or one direction only. Men have also reasoned from a tri-dimensional world to a two-dimensional and a four-dimensional one.* Let us accordingly assume a one-dimensional being who is part of a straight line. Now does it make sense to think of a line that shall have no breadth and no depth? It certainly does not. Every imaginable line exemplifies every direction at once. A perpendicular line without breadth or depth is a monstrosity, and cannot be conceived. Hence all the arguments about one-dimensional or two-dimensional beings which are to illustrate the existence of four-dimensional beings are based on bare abstractions. Though men are supposed to be three-dimensioned, yet they neither live in the third dimension alone, nor are they aware of taking advantage of any two-dimensioned or one-dimensioned being. Why, then, assume beings who live in a fourth dimension and play tricks on those who live in three other dimensions? Why not imagine a being which lives and moves (?) and has its being in a mathematical point? Why not have beings for every kind of direction? Why are we three-dimensional beings unaware of any two-dimensional beings? How could beings of four dimensions escape detection as regards their three dimensions, and how could a being of one dimension, a fourth dimension, interfere with beings of dimensions to which it does not belong? The three-dimensional doctrine of space must be regarded with suspicion, for such a division merely selects certain few factors which are not what they appear to be. We know nothing of a space less than three-dimensioned, as ordinarily understood, and the conception of three bare dimensions, is empty. Thus also the notion of a four-dimensional or five-dimensional space is a barren play upon numbers, arising from the handling of misunderstood formulae.

We may turn now to more general considerations. We look upon a piece of land, and we remark that there is *space* to build twenty houses on; so, too, we glance into our purse, and say that it is *empty*. Now note, not only is vision three-dimensional, but its field is unbroken by any points of no vision. Hence we never see nothing, never really gaze into vacancy. What do we mean, then, by an *empty* purse? There is but one answer. Certain lines are observed, where certain other lines or complexes are imaginable. Instead of the worn lining, sovereigns might be seen; instead of heaps of refuse, houses might be seen. It is not that a full purse is an empty purse plus coins; it is a purse the lining of which is made of gold and not of leather.

What, then, is meant by *space* and *empty space*? Are they a mysterious somewhere where lines are placed, a hole without walls where things are situated? One fails to catch the sense of these phrases, except in terms of lines. If the nearest row of houses which is within the view were pulled down, I could see the exterior of the next row behind it. So, too, the exterior of the row to be pulled down could be made to vanish, by building in front of it, by changing the lines. Similarly, since only one line in one position can be seen on a smooth two-dimensional plane, two things cannot simultaneously occupy the same space. Again, most lines may be displaced by others; and hence men speak of latent lines, of space. Infinite space, except as meaning infinite expanse, or infinite endeavour to see, is infinite nonsense: you might as well say that you could imagine a room without boundaries. If we could stand on an overhanging promontory of a flat world and look outwards, we should have the immediate environment of the eyes, and around us, perhaps, some grey expanse. This expanse might be imagined indefinitely retreating as we advance into the gloom; but wipe out the lines, wipe out sight, and not space but nothing is left. Assume that we are beings of but one sense, that of vision, and there can be little doubt that by space we mean certain line relations and details; and that apart from these relations the word has no meaning. Thus space, being a relation between systems, cannot exist prior to systems, nor can it survive them. Large, small, round, square, are visual terms. When we are once convinced that space is not a glove into which the world fits, our difficulties are soon overcome.

The space of touch or resistance has the same character as that of vision. Take this example: resistance is felt; I raise my arm with that feeling of resistance in the palm of my hand; I try to close the hand, and certain uniform resistances develop. I then speak of holding in my hand a large, heavy and smooth ball. These compounded feelings *are* the immediately given solid matter (Sec. 172). When, therefore, in matters of touch we refer to moving things, or empty space, these tactual facts of a highly developed order (sec. 19) are invariably implied; and apart from them the word Space loses all meaning. If, again, two senses yield the same notion of space, it is because a comparison can be drawn between what happens in each case. A large visual table viewed close by is, for this reason, connected with the equally large supply of touch material, and this because there is generally equality in relative size, roughness, division, etc. [*Test.*]

The other senses, if only regarded at their best, are likewise spatial. We can tell by sound a big waterfall from a small one, or the crash of a house from the fall of a piece of bread. Depth, too, can be well observed in the increasing volume of sound of a heavy railway van that is approaching us. Up and down, as well as position, have also something corresponding to them in sound. Doubtless hearing is still far from rivalling touch or sight,—since it is strictly three-dimensioned, offers few details, and is discontinuous,—but it occupies nevertheless substantially the same position. The rising and falling of the sound, however liable to misinterpretation, as are visual and tactile systems, is as much a spatial fact as the visual scheme, and since they occur together, we may speak as legitimately of aural space as of touch space or sight space. For this reason it is allowable perhaps to imagine a man who can hear every atom of his food, and hear his whole environment.* Again, the remaining senses, those of smell, taste, temperature, pain, etc., can likewise be conceived of as spatial, and that by virtue of their yielding details which are comparable in some respects to those of vision and touch. Our catalogue is not yet ended, for, as far as the feeling element is concerned, all desires, sentiments, emotions, doubts, hopes, fears, and volitions, corresponding as they do in point of time with certain traceable nervous states, have theoretically a right to be considered as spatial. Their rudimentary condition, as regards wholesale correspondence with touch and sight, is a mere accident so far as we are concerned. Special non-transferable qualities all these have; but this is true also of the two master-senses. To say that a sound is not extended, meaning thereby that sounds are not sights, is an unilluminating remark; it were as true to say that sights are not extended because they are not sounds. Nothing is easier than to imagine sound to be a guide to touch, as sight is, and with a corresponding three-fold aural division given, we have three-dimensional aural space. And so on with all happenings. [*Test.*]

The nature of secondary systems is here also of importance, for three-dimensional visual space exists in that portion of the series which we call memory, and might equally exist as regards touch images (sec. 169). This is so plain that it is difficult to realise how a thought-of friend or a re-developed visual system, having certain lines, could be considered as unextended. To us it must be final that the thing sensed and the thing imaged are one, equally extended or non-extended, though blurred images wipe out dimensions and motion. [*Experiment.*]

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* On the localisation of sounds, see Kries, *Ueber das Erkennen der Schallrichtung*, 1890, and Munsterberg and Pierce, *The Localisation of Sound*, 1894.

Nor is it easy to understand what is implied in space being a single expanse. I have many times observed simultaneity in primary and secondary views; for instance, while reading quickly, I have re-instated a visual scene (sec. 120). There is no compelling reason, in theory at least, why I should not think simultaneously of the same thing in the same position in which I am now taking account of it by means of the senses. As space is a visual complex, all we can say is that many spaces may exist, but that on any one given plane, they naturally cannot mingle. In this sense, too, we must interpret the spatial appearance of things from different distances, for here we obtain an infinite number of worlds or spaces, arbitrarily swelling and shrinking. [*Test.*]

We have completed our analysis of the nature of space. When extension is said to be a property of the primary world, one of two things may be meant. It may be contended that only that which is seen or touched is primary; but then the theory is reduced to this, that we arbitrarily include in the definition of what is primary two only out of many kinds of systems. Or else we may mean that sight and touch alone point to space; but this we have found to be more than doubtful. Hence we reject the philosophic doctrine of space. Space is only a casual aspect of things, especially if restricted to sight and touch, and introduces no fundamental divisions. It is in itself a highly elaborated complex, which has no existence apart from visual, tactile or aural systems; nor can we think of space as being the mould in which shapes are cast, or as capable of pre-existing and surviving shapes. For this reason one of Kant's forms of thought finds no support in fact. Space is no underivable form of thought, nor is it the foundation of a broad-based classification.*

Such is our ultimate conclusion on this important topic. To have found a line of demarcation as definite as that which divides the sea from the rocky shore, would have compelled us to re-consider our general standpoint. As it is, the philosophical distinction is not a scientific one. It was born in days when a close dissection of notions was only undertaken in a speculative manner, *i.e.*, from the point of view of some other equally speculative theory. The psychologist is not satisfied with defining the contents of such philosophic notions; he shows them to have arisen illegitimately.

For the sake of simplicity I have ignored those characteristics connected with vision which seemed to be of less importance. They are the following:

(1) The field of sight cannot be correctly described as a perpendicular plane of colour; the inside of a bowl, forming the concave of half a sphere would better represent it. At the same time the concavity, since sight is partial and teleological, is not visible; it can only be traced in summing up the directions in which visual systems develop. On the physiological side this is illustrated by the practically spherical nature of the eye, the exposed convex half of which is the complement of the shape of the visual field.

* J. S. Mill (*Examination*, 1865, p. 231) says that "the idea of Space is, at bottom, one of time."

(2) Every portion of the retina is not equally sensitive to light. In seeing, this is observed in the fact that only a small part of what is within the view, when the eyes are at rest, appears distinct. If we scan, with eyes fixed, the margin of the field of sight, we find that what is observed loses in definiteness and in colour. [*Experiment.*] With adults, however, what is vaguely seen at the margin is interpreted by relevant memories, and also serves as a mode of visual transition.

(3) (*a*) Without moving the head or the body, all the details in the field of vision immediately in front of us, to right and left, up and down, may be developed consecutively with equal clearness, the margins of sight being displaced. [*Experiment.*] Along with these changes go certain organic feelings of varying strain; and if we look into a mirror, we shall learn that in such a case the eyes move freely in their sockets to right and left, up and down, to right and down, converging, becoming parallel, and the like. (*b*) More can be seen, if the observer's eyes are consecutively observed to be opposite different stationary points. [*Experiment.*] Here also feelings are noticeable; and a mirror proves that the head is changing its position while the other portions of the body are at rest. (*c*) Leaving out all complexities, I may be moving, or I may be on a steamer or in a train, and then I have the largest possible visual field and a new set of feelings. (*d*) Among other non-visual changes is the strain in seeing with effort and in accommodation for near objects. [*Test points* (1), (2) *and* (3).]

Berkeley was compelled to admit that "the visible square is fitter than the visible circle to represent the tangible square" (*Essay on Vision*, 1709, sec. 142). With this admission that argument breaks down which detects no likeness between touch and sight, and deduces accordingly the notion of extension from touch alone, as if touch were not a complex product like sight (sec. 19). In the same way J. S. Mill is without an answer when Sir William Hamilton urges that if sight takes cognisance of colour, it can only do so by taking cognisance of some sort of contour (J. S. Mill, *Examination*, 1865, pp. 238-41). If these two positions be granted, as apparently they must be, then we have a complete case for the possible independence of the visual appreciation of space. Prof. Bain contends that measurement by yards or feet implies paces and movements of the arms; but, strange to say, he offers no evidence beyond his assertion[*] (Bain, *Senses and Intellect*, 1894, pp. 389 ff.). The visual yard, assuredly, is a valid one as long as it remains true to itself and its environment, while its shrinking with distance, brings with it no jar in the visual harmony. For the rest, it is injudicious to assume that in practice any sense, visual or other, does not gain assistance from hints thrown out by its fellow senses. Thus the feelings connected with the movements of eye, neck and limb, are sure to assist in visual apprehension.

The following are articles on space perception which have appeared in psychological journals. Arber, *Convergenz- und Accommodationsbewegungen*, 1896-7; Ashley, *Intensity of Light in Visual Estimates of Depth*, 1898; Binet, *La Perception de l'Etendue par l'Oeil*, 1886; Bourdon (*La Perception Visuelle de la Profondeur*, 1897) concludes (p. 54) that monocular vision supplies no notion of depth, nor does convergence do so properly; but biretinal vision does; "normal space, in the strictest sense of the word, is a visual phenomenon"; Bourdon, *Travaux Récents sur la Perception Visuelle de la Profondeur*, 1896; Bourdon, *La Perception Monoculaire de la Profondeur*, 1898; Cornelius, *Zur Theorie des räumlichen Vorstellens*, 1891; Dunan, *L'Espace Visuel et l'Espace Tactile*, 1888; Dunan, *Un Nouveau Cas de Guérison d'Aveugle-né*, 1889; Egger, *La Perception de l'Etendue par l'Oeil*, 1886: Ford, *The Original Datum of Space-Consciousness*, 1893; Hillebrand, *Das Verhältniss von Accommodation und Konvergenz zur Tiefenlokalisation*, 1894; Hillebrand, *In Sachen der optischen Tiefenlokalisation*, 1897; Hyslop, *Helmholtz's Theory of Space-Perception*, 1891; Hyslop, *Experiments in Space Perception*, 1894; Janet,

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[*] Similarly James, *Psychology*, 1890, ii, p. 267: "Measurement implies a stuff to measure. Retinal sensations give the stuff; objective things form the yard stick: motion does the measuring operation." Stricker (*Das Bewusstsein*, 1879, pp. 48-9) reasons that place is directly apprehended, that movement adds extension, and that sound has no extension because the ears cannot be moved independently.

De la Perception Visuelle de la Distance, 1879; James, *The Original Datum of Space-Consciousness*, 1893; Judd, *Ueber Raumwahrnehmungen*, 1896; Judd, *Visual Perception of the Third Dimension*, 1898; Montgomery, *Space and Touch*, 1885; Müller, *Ueber Raumwahrnehmung beim monocularen indirecten Sehen*, 1898; Rive, *Sur la Genèse de la Notion d'Espace*, 1889; Robertson, *The Psychological Theory of Extension*, 1888; Robinson, *Light Intensity and Depth Perception*, 1896; Spencer, *Our Space-Consciousness: A Reply*, 1890; Stratton, *The Spatial Harmony of Touch and Sight*, 1899; Stumpf, *Ueber den psychologischen Ursprung der Raumvorstellung*, 1873; Sully, *The Question of Visual Perception in Germany*, 1878; Tawny, *The Perception of Two Points not the Space-Threshold*, 1895: Venn, *Our Control of Space and Time*, 1881; Ward, "*The Psychological Theory of Extension*," 1889; and Wundt, *Zur Theorie der räumlichen Gesichtswahrnehmungen*, 1898.

182a.—THE SPACE OF SIGHT AND TOUCH.

As we have seen, Bain and others allot the first place as regards space to touch, and they regard sight as becoming intelligible only through tactile reactions. A study of infancy, however, does not bear out such a view. *The child learns to discriminate visually, independently of touching things.* So true is this that adults are astonished when *infants respond to touch without in any way connecting it with what is seen*, and *vice versa.* It is when things move—when the same picture continuously changes its frame—that the child begins to differentiate what is visually given to the adult. This being so, and the visual interest having an independence of its own, the child's power of visual discrimination becomes progressively perfected. Sight is, therefore, in no fundamental sense a handmaid of touch, and the visual world has much in it that could not be imagined by blind men. The words *a house, a church, a street, a field, a landscape*, convey to us scarcely any intelligible meaning so far as touch is concerned. No blind man could feel these things, in anything like the fulness in which we see them. And how, for instance, should a being deprived of sight, translate our picture of a tree into touch thought? The truth seems to be that sight is not primarily dependent on touch. [*Compare a wall as seen with one as felt.*]

The notion, again, that touch is something more primitive, more immediately given, and less complex, than sight, is soon dispelled when we study its development in the young child. There we see that grásping and handling, pushing and pulling, pressing and caressing, are capacities which unfold very hesitatingly. It is only when these lower stages are overcome that the hand seems easily to obey complex impulses, and to examine minutely what is given by touch. When that stage, after some years, is reached, we observe the process complementary to that of sight. Leaving aside lips and tongue we know that the hands are the only appreciable medium for touch sensations. Just as the eyes move to right and left and up and down, so the arms, hands and fingers form the focus of touch. The tips of the fingers, being like short-sighted eyes on long movable stalks, can close collectively round a small object; but they can *see* very little at a time, and it is with difficulty that they find themselves at home in the world without the large canvas of sight. For this very reason, the blind man *gropes* his way, and, in the dark, we examine objects repeatedly and delicately. Also, since the upper extremities are regularly applied for measurement, measurement comes to be in time prompt and exact. Here, however, what happens corresponds with what we know of sight, where also the normal appearance of familiar things serves for guidance in matters of measurement. And again, as in sight, so in touch, the spatial judgment represents the summation of a complicated series and is properly an after-sensation. In addition, it need scarcely be mentioned that touch illusions, like sight illusions are not infrequent. I find that with the imagination well in training I can, excluding sight, imagine my resting extremities to be in almost any position, and I also observe that my guesses as to their whereabouts are often wide of the mark. [*Test.*]

The conclusion, therefore, is that, as regards space, touch is not to be placed on a different footing from sight. Both are complex developments, both develop to a considerable extent independently, and both are unintelligible unless we regard space as a complicated touch or sight system.

183.—TIME.

Time implies certain observed changes, that which *is* being out of time. When, accordingly, we see one tooth, in the wheel of a moving machine, twice reach the spot whence it started, while a tooth in another wheel close by makes but one revolution, we call that a difference in time. Were the whole universe as idle as a painted ship upon a painted ocean, the notion of time would not exist. Time merely expresses certain observed relations of a certain class; a kind of fourth dimension which enables two things to occupy the same place. By the very nature of the relation, then, all but simultaneous happenings are comparable. While, for instance, the second hand of a clock goes round once, certain sentiments, thoughts, sights and sounds may recur several times. Hence, as in this world of change all systems give way to others, they can be all compared in that respect, that is to say in respect of time.

Measurement of time depends on regularity of occurrence. If the world reeled along like a drunkard whose stumblings cannot be foretold, we should only notice more or less of time without being able to measure it properly. As it is, there is comparative order and regularity, and so we can, with some degree of nicety, make temporal deductions by fixing on the passing and coming of a system or complex like the sun.

To contend, therefore, that things happen *in* time, as in a womb, is to forget that we have only to do with a labelled relation, and that in accordance with normal development the relation, owing to its frequency, obtrudes itself, and is in due course baptised into the fellowship of notions. Time, then, can only be thought of as a relation, and not independently of things. To sweep away all changing systems is to destroy time; for there is no time apart from them. Pure eternity is pure nothingness. To look before and after requires a position whence you look and one whither you look, while to abolish these two positions and yet to retain time is as if you deluded yourself with the hope that the corpse drifting landwards is a lusty swimmer.

Time is a relation and not a thing; it is a certain notion consequent upon certain recurrent reactions. Kant's second great form of thought must hence be discounted, his main contentions about it being questionable in fact. Wide in scope as the time relation is, it is but one of innumerable relations, and of no special theoretical importance.*

184.—ORDER.

According to the needs of practical life and the stage which has been reached in human development, various relations are observed and insisted upon. Such words as far, near, close, removed—or much, little, adjoining, distant—apply not only to space, but to other relations such as time, colour, tone and pleasure-pain schemes; for instance, we say that certain things are far removed from each other both in space and time. So, too, in the several hundred distinguishable shades of grey which are intermediate between white and black; we speak of some as being farther removed from black than others. Thus in the tone scale some notes are nearer to or farther from some of the others. Nor is the spatial language employed metaphorically. It expresses the simple fact that there is something in the spatial relation which is to be found in a number of other relations, such as those dealing with lines, colours or sounds.

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* Glass, *Ueber den Zeitsinn*, 1887; Kollert, *Ueber den Zeitsinn*, 1881; Meumann, *Zur Psychologie des Zeitsinns*, 1892-3; Meumann, *Zur Psychologie des Zeitbewusstseins*, 1896; Schumann, *Zur Psychologie der Zeitanschauung*, 1898; Stevens, *On the Time Sense*, 1886; and Vierordt, *Der Zeitsinn*, 1868. See also Mach, *Beiträge*, 1886, and Munsterberg. *Beiträge*, 1889-92.

However, at this point the reader need only be reminded that there are armies of relationships, each of which may be called a form of thought, relationships which it would be well to examine in a scientific temper for the purpose of discovering the most pervading characteristics of systems.

The student may note that such terms as straight line, perfect circle, length without breadth, mathematical point, absolute space, absolute time, perfections are, in the first instance, notions drawn by the ordinary man from the naive observation of the facts of experience.

185.—Cause and Effect.

A young child meets facts in a spirit of refreshing originality. The shilling piece, which, it is suggested, has disappeared because we whistled, and which we bring back by clapping our hands, has, for the child, literally vanished and then come back out of nothingness. Thus I can redevelop an incident of two children watching with evident delight the supposed act of throwing a coin into the fire and fetching it out again, or the supposed act of sharply rapping the knuckles against the ends of the hard table without consequent injury. For all the child knows matter and energy may be freely destroyed or added to, while things may happen for no reason or for opposite reasons. There is no necessity of thought which compels him to assume an antecedent for every change, or a rigid connection between what happens.

What is true of the child, holds good of the adult, or of some adults. I personally feel like the children described. I do not see, apart from mediate considerations, why the coins should not vanish into and out of nothingness: why I should not spirit the coins into and out of the fire: why the knuckles should not be safely rapped; and why there should be any one explanation or any consistent explanation for anything at all. If we admit no backstairs interpretation, that is, no interpretation based on inference, the adult's ordinary life leaves abundant room for such concrete or anarchical generalisations. Nor do I, even as an adult, feel any compulsion as regards the order of existence. That there is a certain order, is merely a fact of memory, and our memory has feet of clay. As I have said so often before, secondary and irresponsible complications form our knowledge, and it is a game of chance whether our utterances are consistent and orderly, or inconsistent and disorderly, while even this generalisation is doubtful.

The law of identity has been invoked as an indisputable truth. Who can doubt that *A* is *A*, or a button a button, or a tree a tree? This supposed law, considered as a matter of practice and not of theory, is as true as it is trite, since it ignores all distinctions and embraces everything. Yet its truth is not so evident as people think. It is doubtful whether *A* is ever *A*, however we hedge the saying round. Thought is in constant flux, this statement being itself a passing theory, and therefore apparently every word, every sentence, and everything is constantly changing its meaning. In whatever way, accordingly, the sentence or the thought is framed, it is in each case a concrete and differing thing. All we can say is that the statement is very true, as far as truths go. What is more, I see nothing necessary about it. *A* is *B*,—black is white,—seems to me as sensible a statement in pure thought as *A* is *A*. Both on theoretical and on practical grounds, therefore, I feel tempted to question the foremost, and of course the most barren, contention of logicians.

So with mathematics. Who can doubt that if to one apple you add another, you have two? No one, I answer, doubts this, who is easy going or who distinguishes between practical and theoretical statements. However, if the cry "necessary" is raised, we are bound to consider the question more closely. We have an apple before us. Its very nature implies that it is ever changing. It is constantly losing certain particles, and adding others to its body. It also parts with much of itself to its environment in the form of smell. To this apple we add a second one, and the scents mingle and a host of organic and other changes and interchanges proceed rapidly and continuously. Hence it is only in a practical and arbitrary sense that there is a definite meaning in the contention that if to one apple be added another, we have two apples. If we abstract the changes mentioned, and speak of additions of figures, we have the problem of *A* is *A* over again, for a figure, like an apple, is a changing something. That 1 and 1 are 2 is merely a concrete and arbitrary statement of capital importance practically, but of little value theoretically.

In this light the notion of cause and effect assumes a new form. As we grow older we more and more consistently observe the same order of facts: the trickster and the conjuror are exposed; apparent divergences are eliminated; prediction is found to be trustworthy; and anomalies are seen to be explicable. Hence we express what happens in pompous sentences of eternal and necessary laws of matter, energy and mind, when all we are justified in doing is to regard the conclusions arrived at as excellent working hypotheses which are not to be easily shaken or displaced by theories which find them inconvenient.

We arrive at the same results when we consider the facts in detail. I see a dish of butter melting by the fire, and I say that the fire melts the butter. Now visually I see the glowing coals and I see the butter undergoing certain changes. Extensive observation is my only visual warrant for finding any connection between the two, otherwise it might be perhaps my presence that is the cause of the butter's melting. If we go deeper into the matter the *A* is *A* problem meets us again. Exhausted primary systems or objects, like notions, are not so simple as they appear at first sight; they are not divided from one another as if they were so many separate universes on rather distant terms of acquaintanceship. Thus if we follow in thought the changes in the glowing coal molecules as they affect their immediate environment and ultimately the butter molecules, we shall be tempted, as in our analysis of the process of satisfying a need, to speak of an elaborate and lengthy process of development rather than of the fire melting the butter, or of cause and effect. It is as though we were to argue that because we press a button and immediately see a hall brilliantly lit up, therefore there is a direct connection between any button pressed and a large place illumined. If the facts are to be truly stated, the whole process must be minutely described, and such a description would show it to be entirely different from the empty cause and effect formula. Granting, however, that the complexity is so great, and the factors co-operating so innumerable as to make an exhaustive statement of the process impossible, it may still be urged that the cause and effect problem remains. Let us assume, it may be argued, a less primitive formulation than the one generally employed, yet it would still be true that, so far as we know, every set of consequents flows out of a set of antecedents. To this I answer that, practically, it is so; every known change is encountered in conjunction with other changes, the absence of which latter changes, known or unknown, is accompanied by the absence of the former. This conclusion, stated undogmatically, but with a due recognition of the ever-present difficulty of exhaustively tracing a process, may be accepted as containing an important practical distinction; but let us cease to speak of necessities of thought.

I have often marvelled how illogical some human beings contrive to be. Recently I came across a girl of about thirteen who could only be said to be non-logical. Wherever fancy or interest entered, her statements were absolutely unreliable and thoroughly inconsequent. She rejected any course of reasoning which clashed with her notions, and accepted in its place any and every assertion as proof of her position. Of course, where pecuniary and other prejudices are allowed to prevail, as they so often are, there all defensible reasoning also ceases. Logic, as commonly understood, is a matter of temperament, except where necessity demands right thinking.

186.—FREEDOM.

According to the illustrious Kant, the unavoidable problems of the pure reason are God, freedom and immortality (*Kritik der reinen Vernunft*, 2nd ed., 1787, Introduction, III). Our unavoidable problem is different: it is to supply a consistent psychological theory as arrived at by an analysis of facts, and our aim has, therefore, nothing to do with either supporting or combating any particular philosophy or religion. The question of freedom nevertheless interests us. Insufficient investigation, undertaken under the guidance of preconceived notions, had suggested that no connected account could be given of man's actions; but a closer inquiry seemed to threaten this apparently useful conclusion. Hence Kant ingeniously suggested that since the law of cause and effect was, in his view, phenomenal, and man noumenal, therefore that law did not affect humanity. Man, therefore, was free. We have already appreciated the vanity of the phenomenalist's position; yet a further word is necessary here as regards this special development of the theory. The world is one, Subjectless and Objectless, except in a mediate sense. Even if it were not, however, little would be gained for freedom by the Kantian position. Of noumena we can postulate nothing, not necessity, nor freedom, nor action. An action, for instance, is a distinctly phenomenal or observable fact, and hence cannot be referred to the noumenal. The noumenal man cannot be said even to be, still less to act; to say, then, that his action is free, is to confuse the two realms. Noumenal man cannot be said to be bound by necessity, since we know nothing of him. We cannot assert that he is, or that he acts, or that he is not bound by laws.

The whole position unfortunately was forced; it assumed as false what was true, and as true what was false. It postulated that motivated action was fatal to morality, while, on the contrary, morality will only reach its goal when the full import of these motives is appreciated. Kant pointed to certain deductions from the indeterminist theory as proof of it, whereas these deductions—such as those embodying the notions of forgiveness, punishment, merit, repentance—are, on the whole, general methods of evading the serious demands of morality. In short, the problem of freedom was a fictitious problem whose solution was not to be found in the noumenal world, but lay in the setting aside of the problem itself as arising out of a confusion of thought. In a unitary scheme of things, there is no room either for philosophic freedom or for the noumenal world which is to serve as its explanation, nor do we admit that the negation of necessity leads a step beyond such negation. The right doctrine on the Kantian basis is that in the noumenal world, as in the Buddhist's Nirvana, there is neither necessity nor freedom, neither action nor inaction.

187.—MENTAL ACTIVITY.

The "synthetic unity of apperception" is a well sounding phrase with little meaning. It is usually illustrated somewhat in this fashion. "Nature gives us only a mass of visual lines, or perhaps a distinctionless continuum, and our apperceptive powers pick and choose, carefully selecting those lines which go to the making of a system, and pushing aside those other lines which are irrelevant. At the same time, like a dressmaker, we arrange things: we see the lines in such a way that the system is developed with its parts in due relation to one another, while the system itself is regarded in relation to other systems, thus yielding two-dimensional and three-dimensional systems. As with single percepts, so is it with trains of thought or with combinations. Subjective activity elaborates the world of things and thoughts; it makes its systems out of a featureless continuum, if that continuum be not flesh of its own flesh."

In observation we find no energy (except as defined in secs. 173 and here), and hence neither physical nor mental activity, apperception being something added to the facts. We observe only certain changes following a certain plan, *i.e.*, need-determined complications, and apperception—in the sense of Subjective Activity—does not assist us in understanding that plan. At the same time no trace of this power—a thing behind a thing—exists, while to assume it creates two problems where formerly there was but one. I repeat, existence is one, and contains no noumenal Subject or Object,—no subject and object behind every subject and object. The world as given is *the* world, and theories of apperception and activity are shadows of it, presuming to explain the substance.

It is difficult to avoid such brief terms as Activity, Energy, Power and Force, and these words are frequently employed throughout this work. Their real meaning is plain. We speak, for instance, of attention energy, meaning by it certain complex changes which the body undergoes. So we speak of physical force, meaning by it certain observable changes when mass meets mass.* Accordingly in the secondary realm, mental activity means the observable relations between ideas as regards their succession and development. Those four terms, then,—Activity, Energy, Power and Force—are short formulæ for indicating certain definable changes.

188.—REASON, UNDERSTANDING.

Reason and Understanding, with capital letters, are terms which should not find entrance into a strictly psychological vocabulary. They embody notions elaborated in speculative inquiries where facts are classified after the fashion of the man who dispenses with rigorous research. Deeply rooted as these words are in common speech, they must the more consistently be ignored by psychologists, until they gradually fall into disuse. They explain nothing, and they prevent explanation. They are, as were astrology and alchemy, too deeply tainted ever to be converted into valuable citizens in the commonwealth of science.

189.—THE SENSES.

In analysing the nature of space, we traced back the full-blown three-dimensional picture to a something which scarcely retained any of the properties of visual systems. The three dimensions were reduced to two, and we learned that by deducting the distance of ordinary vision and abolishing contours, the remaining two dimensions became doubtful in character. In this way a door was opened for the effective discussion of the problem of the senses. While each sense was considered in its most highly developed aspect, in full dress uniform, comparison was out of the question; but the case is different when each of them is considered in its simplest possible form. Unfortunately there is no room here to make an extensive analysis of the various senses similar to the analysis we have instituted of visual systems.* The visual inquiry must, therefore, be taken as an illustration of the general method of solution. This is the more permissible as vision is the king of the senses, and as, therefore, the simplification of this one sense removes the chief obstacle to a general scheme of conceptually reducing all systems to one class.

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* "A certain variable quality of matter (the rate of change of its motion) is found to be invariably connected with the position relatively to it of other matter; considered as expressed in terms of this position, the quality is called Force" (Clifford, *Lectures*, 1886, p. 278).

Let us assume, then, that careful examination has yielded the lowest factor in each sense or class of systems. Sound has ceased to be the sound we ordinarily know; so has smell; so have taste and touch; and so with all systems. We have noticed that sight thus reduced comes to resemble conspicuously those vague systems we call elementary sensations or feelings. We shall, therefore, take for granted that a similar analysis of the various senses would produce a like result. Hence we have left for consideration a number of systems which resemble in their primitive condition vague feelings rather than definite integrals, or sensations and images. From this it is only fair to conclude that vision, hearing, etc., are not distinct qualities; that they are not even related; but that in our model view of the world, they are various compounds of one simple feeling. Thus just as chalk may be thought of as in a piece, or as spread out on a blackboard to form the most dissimiliar figures, so the sense products *may be* regarded as world atoms, diversely compounded.

The precise property of this residue is of little significance to us, its simplicity and potency alone being pertinent. Hence as the feeling of resistance is at once one of the most important and yet one of the vaguest of feelings, we may regard it for the time being as the unit of existence, though we must exclude from that feeling all complexity added to it by accumulated acquisitions, or read into it by the inclusion of possible relations.

It would be rash to deduce from this that the resistance feeling alone is the reality, or that that feeling leads us one step nearer to the ultimate. The conclusion is rather that a scarlet poppy and the dimmest of feelings are essentially on the same plane, the matter of both being alike, only variously compounded. Hence, too, all systems—all notions and objects—no matter what their condition, are equally real and ultimate.

Something more, however, may be said as regards the close relation of the sense material derived from different senses. In doing so, different ways are open to us. In eating, for instance, analysis proves that much of what has been attributed to the sense of taste is due to the sense of smell. Here, then, men have universally confused two senses. So also with the senses connected with the skin, with pains and with movements: because these various sensations—which analysis is dividing into ever more species—occur frequently together, they have been more or less thrown into one group by all but the professional psychologist. In this case, too, sense differences are not obvious, the sensations of heat, cold and contact being related to one another, as are the sensations, say, of blue, red and green. We may approach the matter in another way, and say that sense material as such forms a poor basis of division. Various factors must be allowed for, as familiarity, quantity of detail, after-sensations and after-images, strain, connection with sense organs, movements involved, ease and continuousness of apprehension, and the like (sec. 120). [*Experiment with the several senses.*] If we do that, it will be seen that there is at least a *prima facie* case for denying that the sense material differs much, even when hearing is contrasted with seeing. Probably if we could alter the factors referred to, we might be unable to tell which is a sound sensation and which a sight sensation. Once more, then, we find reason to think that the sense material offers no barriers to a unitary view of things.

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* The sense of touch is analysed in secs. 19 and 172.

In this section I have only attempted to show that a simplified view of things is possible which shall embrace all our acquisitions in one graduated scheme. There is no attempt here to account for the differences; but only to show that there are no violent breaks and no deep chasms in the world as given. In the concrete the difference between blue and yellow is as final as that between blue and sweet.

190.—PERSISTENCE.

There is one striking fact which we observe exclusively in primary systems. To illustrate, the primary and the secondary views of a boy at a given moment may be said to be alike; yet under favourable circumstances the image of the boy will remain unchanged after twenty years, while the sensation after that period shows some one tall and broad and bearded. In the image, assuming no active interference, wear alone is observable, while the size, shape and colour have not changed except through fading. [*Analyse some instance.*] Theoretically, secondary systems or images may change as sensations or primary systems do, and in the exercise of the imagination that happens to some extent. The broad division is, however, not to be gainsaid.

When we look more closely into the matter, we observe the following. I trace for one minute a cloud passing over the water and note the effect in the change of colour of the sea. If I continued observing for another minute the distance traversed by the cloud would have doubled. Instead, I cease to look for the second minute, and after that find, on reopening my eyes, that the shadow is far removed from where it was when I closed them—in truth, the distance is doubled. Allowance must be made for this fact of systematically changing complexes, change, in the scheme of things, being independent of the presence of seen bodies or selves, since these bodies are but small arcs of a large circle. In secondary complications—in association—therefore, the stability and continuous change of the world is tacitly implied. Things, so to speak, change before our eyes, and these changes are registered; when things, then, are found to have been transformed in our absence, the change is assumed to have taken place in precisely the same manner, and a similar conclusion is drawn. Whether I undertake to watch a lengthy process once or twice, the final result in the first case is accepted as a guarantee that the second observation would have seen a repetition of the first set of changes.

What has been, has been; and hence if the earlier images of the world series continued changing, they would lose their character and become the later, thus destroying the sense of the past, or the series which constitutes the present and the past. The world picture is one, and hence the past is unchangeable. We do not in the strict sense re-develop what happened yesterday, nor is yesterday here; but yesterday is just yesterday, and to live yesterday over again in imagination *is* yesterday. The past does not insert its tentacles into the present, for then it would not be the past but the present. In the same way an imaged future *is* a future. It is only when we assume a Subject—a something within a something—that we can mix up past, present and future. The world is one; and past, present and future are what they purport to be.

191.—EVOLUTION.

If we seek for a unitary view of things, it is vain to surreptitiously assume feelings, touches and sights for the purpose of explaining the origin of feelings, touches and sights, *i.e., the cutaneous surface and the retina which are to solve the riddle of touch and sight—the world as given—are touches and sights themselves.** In this direction no progress is possible, for the question is begged; while even the end attained in this way gives us merely two relays of sight and touch.

Let us assume a pure visual world, and let us abstract all but visual systems. Then, tracing back its evolution, we expect, as we go back, to find that secondary systems did not assist primary ones, *i.e.*, memories did not assist action; that lines not being membered in relation, dimensional space was not yet developed; and that minuteness of detail and colour were still unevolved. We should gradually work back in this way to something resembling simplified resistance feelings. Accordingly, at the beginning of life, slight changes, favoured by natural selection, would result in slight visual differentiation. As these changes developed, so vision, in this imaginary scheme which only aims at consistency, became pronounced to the extent known at present.

For sight we may substitute any of the other senses, and in that case a sound world or a smell world might develop from the imperfect rudiments referred to above. Still, we must not omit to notice that since the various developed systems—our various sensations—are all complexes, one class of sensation cannot give rise to another, any more than a steel knife can become a steel fork without ceasing to be a steel knife. The successive presence of a sight and a smell, can never argue that the latter evolved out of the former; for sight, by hypothesis, must first be reduced to resistance feeling or to something which is not sight, before it can change into smell; in other words, sight has first to cease being sight. It is possible, then, to imagine beings whose smell or hearing is so highly developed that they live in a world as complex as their brother visual. The actual stage of human smell attainments, for instance, is immaterial to us here. Already we know that some individuals gain appreciable knowledge and guidance through this sense, while the dog and other animals stand far higher in the scent scale than the human being. Just as a man may, by some keen-scented individual, be distinguished by scent, so may his clothes, and so indeed, might every point on every so-called physical surface. We must, therefore, regard every sense as having the same theoretical and convertible value. Thus by *things* we might mean certain sound and smell systems, the other systems, on account of their supposed vagueness, being looked upon as appendages to those two.

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* As has been pointed out before (sec. 171), if we mean by the skin and the eye the *reality* which underlies their *appearance*, then the *appearance* of trees and houses must be assumed to have underlying them respective *realities*. There is, therefore, no reason, on this hypothesis, why special importance should be attached to the development of the real or *noumenal* body, if it is a question of explaining the *phenomenal* world.

We have considered separate sense worlds. If we take the world as it is, we have a congeries of senses constituting one world. Instead of tracing forward the development of one sense, we follow the evolution of a number of senses. To imagine a so-called physical world, *thought-of as sight and touch, receiving at some point a shock which introduces sight and touch*, is a method open to question, though it is one of the current methods of explaining the evolution of mind. Just as sights became differentiated, so did smells and tastes. A seen sense apparatus is a bare visual product, and cannot explain sight, still less the other senses. *The body, as a tactile and a visual system, is only a convenient vehicle for following connectedly the constitution of things.*

192.—OTHERS.

From the promenade where I often sit I watch the passers-by, and what I specially notice is human bodies which are freely moving. I also hear their voices and see them looking about. Their bodies may be touched and seen, like that one—*our own*—which can always be touched or seen. If I enter into conversation with one of them, articulate sounds are heard.

Let us examine an instance. The various persons, as seen and touched, are part and parcel of the world around my body, and so far they are uninteresting. They also move freely, their movements conducing sometimes to my welfare, sometimes to the contrary, and so far they are decidedly interesting. If they resemble one another closely as regards sense character, the view received by five of them looking consecutively in one direction from one point is the same, as would be discovered if they exchanged opinions. So with smells and tastes. If five persons simultaneously put their tongues to a sugar loaf, the result in the taste is precisely the same as it was in the sight. If, again, these five experimenters are pricked with a needle scientifically, there will be a pain world, as there was a sight world. So again, under closely related conditions, they say and they feel "How fine!" as they look upon an apple tree in blossom. Thus, similarly placed, they re-develop some event in concert, or use the same method to work out a problem. If it be granted that two persons can see the same thing, it must be allowed theoretically that they may equally have all systems in common. To say that "We call physical whatever is the possible object of experience for several subjects, and psychical whatever cannot be experienced by more than one" (Münsterberg, *Psychology and Life*, 1899, p. 47), is to hold that all the systems may theoretically be at one time physical, at another psychical. To argue that five people looking at one radiantly hot sheet of iron close by them, see something physical, while the pain caused to the eyes of all five by the blinding white iron is psychical, only appears reasonable if we assume that we ought to see the pain if it be one and not five pains (for assuredly the eye-ache—like the sight—"is the possible object of experience for several subjects"). However, this assumption is absurd, since one might as well contend that the seen sheet is psychical because it is not felt as pain. If there be more certainty and uniformity in the one case than in the other, that is accidental, since men might react equally to pains and unequally to sights. It is, therefore, superficial observation only which can speak of one sheet of iron and five pains. Hence we conclude either that there are as many worlds as there are persons or that there is but one world. Münsterberg's distinction does not carry with it conviction.

If we suppose, then, that sensations are alike in all men; it will follow that there are as many worlds as there are persons. In that case there is a separate world in connection with each separate seen body. While, therefore, I should, in the usual way, see a street with 500 people, I have to imagine that each of the 500 sees a street of his own. The world would, under these circumstances, have to be considered as consisting of 500 worlds, as the 500 men certainly sense 500 pictures. Even in this case the unitary conception would still persist, for the one body would simply be placed in imagination, in another place,—just as locomotion gives us ever varying views,—and if the primary systems differed entirely, then it would only be a case of ordinary complexity. By opening and shutting my eyes twice in succession, I obtain two pictures of an object; I might thus acquire thirty, and can, therefore, readily understand a multiplicity of worlds without affecting fundamentals. Whether, then, there be one like world with many bodies, or many like worlds, no difficulty exists that we need notice.

It is different when one man sees red consistently where another sees green consistently. Here we have a certain seen body and a red view, and another seen body and a green view. If sensations thus consistently differed both as to their elements and their composition, we should truly have a number of worlds. Yet curious as it may seem, the difficulty here is not as great as it appears. We often see a thing at one time clearly and at another indistinctly, and consequently differences in idiosyncrasy are readily imagined. We simply say that given a certain body we have a red world, while given another seen body and we have a green world.

In speaking of persistence, it was pointed out that objects or exhausted systems undergo systematic transformations and that every such system has its own history. This is naturally the case with seen human bodies. As but one class among many, these have each their own history. While one piece of pottery falls onto a stone surface and is shattered, another near by remains undisturbed and unbroken. So while one man's palm comes down heavily on a smooth piece of iron, so that the whole hand tingles, another standing by who merely watches him, naturally does not feel the tingling. Different circumstances, different results. Thus throughout the history of living and non-living things the reactions of different individuals diverge rather than run parallel. One of the most striking illustrations of this, is the case of memory. While ten people are seeing or smelling one thing, each of them may be having different secondary visual views, one thinking perhaps of a book and another of a meadow. In this case the visual systems connected with two seen bodies are different. Yet this raises no special difficulty, since the same thing may happen in one seen body: we have merely diverging circumstances and pasts, and hence diverging systems. Where the circumstances converge, there the systems converge also, *e.g.*, two persons think of the same thing in the same words. Accordingly, with complete convergence of circumstances, complete and universal harmony in primary and secondary systems would follow; but this has to do only with the jointedness or the disjointedness of things in general. In closing this section one may remark that with a sense of smell as highly developed as that of sight, we might indifferently speak of the seen body or the smelt body, the visual reference being at present preferred in practice because accidentally it is most marked. [*Imagine, in succession, the body having innumerable eyes, ears, noses and palates.*]

Bain (*Senses and Intellect*, 1894, p. 2) argues precisely as Münsterberg does: "In observation, by the senses, we can work in the company of our fellow-beings; the same world that is open to one is open to all, and the impression made is substantially the same for all. In the exercise of introspection, each of us works apart and alone; hence the study of the Subject is purely individual."

193.—SUBJECT AND OBJECT.

The present field of sight reveals an extensive rural view, together with a portion of a seen human body. This view and this body are objects. Studying microscopically a pebble by the roadside, I can see how it is affected by a variety of other objects or exhausted systems far and near. The distant sun warms it, the shadow of the tree above it at a certain time of day cools it, and wind and water round it and disintegrate it. Furthermore, by watching it carefully, I can tell what changes are going on in its environment. From its heat, I argue to the sun's rays; from the passing shadows to the shaking of the foliage above it by the wind. This relation of objects or exhausted systems naturally holds good throughout the compass of existence. For the same reason one system may reflect more accurately than another the state of other systems, and, therefore, a thermometer and a barometer respectively tell much more of changes of heat and atmospheric pressure than a pebble can. So likewise the sea is more affected by wind than the land, while the surface of the sea is more influenced than the depths immediately below. Reasoning along this line we may imagine an object which shall be most delicately sensitive to every change in its environment, registering with wonderful completeness what goes on in its vicinity or at a distance, and adjusting itself to those circumstances. As regards impressibility, there would be but a difference of degree between this one body and all others, and in this position is that human body or object in the rural scene, which is observable whatever other visual changes take place. If I experiment with that body, called usually "my" body, I observe that it is so constructed that little happens in its neighbourhood which does not affect it or to which it does not react. In this sense I can know more about the pebble by studying the body than about the body by studying the pebble.

There is one considerable difference, however, between all other exhausted systems and that body. While pebble after pebble may vanish, the body as a visual system normally remains, and is, therefore, the most interesting system. We have, then, to regard it as a constant portion of every imaginable environment as far as that is thought of as immediately given. Nevertheless it is but one exhausted system among many, being chiefly characterised by its permanence and its complexity. As the body is only a visual thing among other visual things, our expectations are confirmed. Through many media or channels influences come to it which produce modifications. These modifications, apart from inference, tell us nothing of other things, and are barely observable changes. If we follow what is connected with the initial changes, we are led to other bodies and things which are themselves more or less responsive to similar influences. Hence *apart from previous knowledge of the rural scene, the permanent body, when examined, would yield no information except changes within itself—no more, in fact, than is yielded by the examination of the pebble.* The point to notice, however, is that the internal bodily changes, as in the pebble, bear some definite relation to the external ones. In this sense, therefore, we can regard the body as an index of what happens in its environment, and as expressing certain relationships in terms of itself.

I have advisedly spoken of the body as visual; but theoretically such language is indifferent. The sense of smell might be so highly developed that our sense of sight could hardly equal it, or, to go still further, we might imagine the relative stages of development of the two senses to be the opposite of what they are now. In those circumstances the body might mean to us a smell system which we should speak of as we speak of the visual body under existing conditions. We might in such a case interpret the world by our olfactory observations. And so it is with every sense. It is an accident theoretically that the centre of existence is regarded from a visual standpoint and not from any and every one of the other sense standpoints. The *seen* body, therefore, only reflects outside changes in terms of its own life. It knows nothing of smell, taste, pains or other feelings. Only if we imagined five sense bodies, reflecting the five senses, could we have outer systems interpreted in five terms, for as far as we smelt we should not see, and so on.

Yet how does it come that concurrently with smell changes there exist sight changes? Our answer must be the one I have previously ventured to put forward. The senses are but different developments of one sense, and hence, theoretically at least, the changes in one sense direction can be to a certain extent observed in the direction of another sense. For this reason the seen body hints at the vast expanse, colour, form, sound and scent of the rural scene. It is certainly not that scene; but if we have studied the body's nervous changes alongside of other changes, then the one may become an interpreter of the other.

The bodily organism is appreciably affected only by what can be of service to it; and we can imagine, therefore, an organism which shall have reached the same stage of evolution as regards touch, sight, smell, sound and taste. As on the touch plane all that happens with regard to sensation is reduced to atoms or vortex rings of a like character, so every kind of primary and secondary system may be thought of as evolved out of a simple and vague feeling or element.

We have learnt that one thing in every scene—a human body—is familiar to us, and we have also noted that its visual expression is casual and not fundamentally determined. From this follows the unity of existence. Our pains, our contacts, our smells, our tastes, our doubts, our volitions, form a connected whole. They do not refer to the seen body, nor are they produced by it, any more than the seen body refers to them and is produced by them. The seen body, being, as it happens, most minutely observable, the other less fortunate systems are interpreted in terms of seen bodily systems, as well as referred to the seen body. All we find, then, in observation is a number of items, the most prominent and persistent of which is a certain system which we call the "self." In this sense, therefore, every object is a Subject as far as all other Subjects are concerned.

194.—LIFE.

Here is a pebble and here a human being. The former is said to be dead, while the latter is regarded as being alive, one distinction being, it is contended, that the latter hears and sees, while the former does not. This plausible distinction we are now able, I hope, to abolish. The pebble and the human being, as seen, neither smell nor see. The pebble, being primitive in its constitution, is almost wholly irresponsive, changes in its environment having but an inconsiderable effect and then chiefly on its surface. With the human being it is different. So complex and so unified is his evolved structure that he delicately and quickly responds to outer changes, even to the length of moving about freely. Here then is one difference—a difference of degree. Visually speaking a thing is alive when it grows and moves like a human being, and dead when it sulks like a pebble. It will be said, however, that the one feels, while the other lacks feeling. If by this it is intended to assert that there is an unanalysable Subject which sees and feels, then we dismiss the question as unintelligible, for it would be necessary to presuppose an infinitude of selves. If what is meant is that the seen body sees, while the seen pebble does not see, we again are bound to dismiss the question, after our analysis in the last section. What we observe is as follows. There are visual, olfactory and aural systems in the world, and all are fundamentally one as far as character is concerned. A germ is fertilised, and a complex centre of activity develops, of which the developing cell is one expression. According to the complexity of this development, so there will be innumerable sense terms in which the new being expresses itself and the world; yet nothing different in kind has been added, on the side of resistance feeling, to the germ or the chemical elements of which it is composed. We have uniform development along many lines, as along the lines of the seen body. We have still something given, neither more nor less, provided we do not postulate the seen body as a centre of sense things. So likewise with the pebble. It is, theoretically speaking, a visual, olfactory or gustatory system, *i.e.*, a thing affecting other things in various ways. Its homogeneity, its want of unity between the distant parts, is but an indication that complexity of sense as well as of movement is absent; for the active olfactory apparatus as seen or smelt, for instance, is but a hint to him who knows that a corresponding system exists. The seen body does not develop smell; but the ground sense or ground material develops in both directions. If, then, we constructed a human being by some chemical process, we should really be constructing a feeling being, for sight is but one modification of primary touch; we should be building better than we knew, owing to our ignorance of the nature of the prime sense. Thus the evolution of life and thought in the individual, and in its first beginnings, presupposes no catastrophe, no break, no superaddition and no two substances, the pebble being merely less highly developed than the man. Chaos and discord must arise when we select one sensation complex, the one that happens to be the most prominent one, and make all other sensation complexes depend on and result from it. If we consider these complexes as developments from one form, then we have no need to explain how, for instance, touch can produce smell, nor are we confronted with the problem of a double world where one world is in attendance upon another.

In the tenth chapter of his lectures on Naturalism and Agnosticism, Professor Ward suggests that just as machines are mind-made, so organisms are inert bodies which are guided and controlled by minds. Life, accordingly, is not some specific vital energy or vital force; life refers rather to a psychical something, endowed with feeling and will. In agreement with this view he contends that the factors in evolution are principally two: self conservation and hedonic or subjective selection. With Professor Ward's negative contention, with his proof drawn from ignorance—that life has not as yet been explained by the physicist—I have nothing to do. I only wish to draw attention to his psychology. According to him, organic functioning is mind-functioning; and the departure of life in plants and in animals implies, therefore, the absence of mind and *vice versa.* Hence it must follow that since brute matter is inert, the innumerable organic functions that are but slowly being revealed by the physiologist, are performed by minds—by ourselves, in the case of human beings. So, too, we must assume that the growth of nails and hair after so-called death, really proves the continuous presence of mind, of the principles of self-conservation and subjective selection, of feeling and will, of spirit, of spontaneity, of effort, of experience and of internal determination! If organisms should really prove to be machines guided and driven by minds, Dr. Ward will not only triumph over the physicists, but he will have established a new psychology in addition.

195.—DEATH.

Life, we have concluded, is not something superadded to brute matter; it is but a development. Consequently any de-development is to that extent death. This can now be easily traced, since the seen body may be justly used as a common measure in the interpretation of existence. When the eyes or important organs connected with them are destroyed, vision, except of a secondary order, ceases for us. When disease attacks certain portions of the nervous system, the memory is impaired or destroyed. For similar reasons, sensibility, smell, taste and pain may depart. If the changes are of a profound nature, the notion of self becomes erratic, or perhaps the complex ego becomes a simple vegetative soul. Vivacity, stupor, sleep, death, are, accordingly, but so many steps in a career. For this reason, just as the complete cessation of some brain process means a loss of visual memory: so a complete cessation of general organic processes means death, or, what is the same thing, change from a highly complex state to a relatively simple one. There seems no alternative to such an interpretation. If in life, smells and volitions had appeared apart from a centre interpretable in given terms, the bodily collapse might have had no other disastrous results. As it is, the bodily collapse is only one aspect of a general dissolution, our smell and volitional constitutions being but modifications of the same fundamental fact. Death, then, is the end of life, as the ashes of a fire are the degraded form of the consumed log of wood. Life comes and goes, like a bubble or a rainbow.

Bishop Butler, in his *Analogy*, 1736, argued that since some dying men are unaffected as regards their reason, therefore physical death does not prove that reason dies with the body. The fact is that in some cases the brain remains unaffected till nearly the last moment of life, while when it becomes affected, as in many cerebral diseases and in death, the reason is seriously interfered with or ceases altogether.

196.—IMMORTALITY.

It might be urged that, as regards life, only a simplification takes place, and that hence we not only continue to exist, but that we have existed from eternity. This is a feasible view. A misunderstanding, however, must be guarded against, for that which is permanent in this case is in incessant change and develops into individualities only under very special conditions which are bounded by birth and death. Immortality, in any other sense, *for the psychologist*, becomes an unintelligible doctrine. We have found lurking behind the series of systems no mysterious Subject which may laugh at the revolutionary bodily changes, or delight in them as a release from bondage. When, for instance, owing to some nervous shock a man is stunned, there seems little to rejoice over; is it likely, then, that when we shatter the brain, the man will be any the less stunned? Unreasoning beings will say Yes to this, as to many other statements equally devoid of foundation. As psychologists, however, we have only to note uniformities, and we must, therefore, assert that life, like form, is liable to evolve and devolve, and that the current notions of immortality, so far as they are based on a false apprehension of the psychological facts, must join the limbo of notions that more exact research has proved to be unfounded.

197.—SCIENCE.

The view which has been put forward in this chapter demands no profound reconstruction of scientific notions. Already science is factitive and descriptive. It does not say that matter and motion are *necessarily* of a certain nature; it only takes observation for its guide, and its assertions go no farther. Physical science, therefore, is not affected by our conclusions, as its form and its methods are unexceptionable. Taking for its subject the most stable and calculable elements of reality, as found in seen and felt exhausted systems, it attempts to obtain the most comprehensive descriptions, and it is only temporarily, we may be sure, that it ignores the less stable elements. Inclined as science was at one time to assume that the true substance lay in this or that detail, owing to superficial observation and owing to the suggestions of the philosophers, its present mood excludes theoretical assumptions. In the final issue, science must embrace the totality of things—systems of sights, smells, volitions, etc.—in one descriptive survey, and the narrow order which it has hitherto allowed for is likely to be extended to systems in general. This, however, will be accomplished by research and not by speculation. Already we have tried to meet the physicists by describing the comprehensive uniformity which prevails in the mental realm.

The modern notion of science and its tendencies can be gleaned from such a book as Mach's *Vorlesungen*, 1896. There, on p. 229, he writes: "While we are at the beginning of our task, it is as yet too early to determine how we shall look upon the world when we are face to face with the closed circle of physical and psychological data, of which we now see only the two separate facets. The men are sure to be found who will acknowledge the reasonableness, and possess the courage, to enter the straight paths leading to the heights whence the total stream of facts can be surveyed, and who will not meander on tortuous byways, guided by chance conjectures."*

There is some danger that science, by its hostile attitude towards the crude notions of our forefathers, should tacitly admit what it explicitly seeks to refute. For example,

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* See also Pearson, *The Grammar of Science*, 1891.

Pearson (*Grammar of Science*, 1891) reiterates that science does not pretend to *explain* or give the why for anything. Science, according to him, only describes or resumes. The difference is surely superficial; for every how is a why, and every why is a how. When a hung picture has fallen to the ground, and the string by which it was suspended is seen to have been worn thin, every man regards such a discovery as *explaining*, not merely as describing, the fall: much-worn strings, he knows, will not support weights. In explaining, we supply the normal antecedent to the event, and this is considered especially satisfactory when the antecedent is a familiar one. The most perfect explanation would be contained in a simple and comprehensive formula which enabled us to foretell the position of anything in the total series of things. For this very reason we must consider the fact of gravitation as yet unexplained, since it stands isolated; and for that reason, also, such regular sequences as the rising and the setting of the sun suggest no permanent relationship.

Similarly with such terms as energy, power, faculty, mind, matter, cause, effect. At worst, they mean a something within a something as a satisfactory description or explanation of certain observable facts. At best, they are convenient terms summing up obscure or complex processes. In any case, however, the terms must have always had a definite meaning, unsatisfactory as that meaning may be in the light of larger knowledge. If, then, these words are to be rejected or replaced, it must be because we have found words which better sum up the facts, and not because these terms express something inexpressible.

Pearson's inquiry into the nature of science, admirable and suggestive as it is in many ways, is marred by a sweeping defect. According to him, the nature of the "perceptive faculty," of the sense apparatus, determines and limits knowledge. What exists outside that perceptive faculty, he contends, it must be ever idle to ask. It is the old story: the earth must have some support, and that support is obligingly given by the tortoise; but what supports the tortoise? So we ask, what is this perceptive faculty and this sense apparatus? Are these not tortoises to support the world; and if so, are they really required? The plain truth is that Pearson makes an assumption which is as broad as it is unjustified and mischievous. If we once admit an unanalysed perceptive faculty, a man within the man, we might as well admit the most foolish of the ancient superstitions: it is as if one exchanged the Hindoo Pantheon for the Pantheon of the ancient Greeks. The widest scientific statements should be purely monistic, all-comprehensive, final, consistent throughout, or they are not scientific statements at all. The explanation of Pearson's attitude is that the nature of thought does not raise in him any problem. As regards psychology he accepts questionable statements as would some young and trustful student. To us the simplified view of things given by science, is a *part* of the whole world, and not something *apart*. Generalisations, relations, and simplified notions are particular facts, and not products of "mind." It is only convenience which would say that existence includes "not only isolated contents of a simple and a complex character; but also their properties, states and relations" (Külpe, *Zur Lehre von der Aufmerksamkeit*, 1897, p. 30).

Of speculations there is no end, and one of the boldest is embodied in the recent work of Münsterberg, *Grundzüge der Psychologie*, 1900. Münsterberg contends that science deals only with facts *as observed*; and he concludes from this that life *as lived*, *felt* or *appraised*, lies outside the domain of science, and that psychology as a science has, therefore, no possible influence on life or on theories of life. By appeal both to fact and to reasoning he then attempts to prove the inanity and uselessness of psychology. The answer to his conclusion is simple. Life, as immediately lived, consists of a series of sense facts—of sounds, sights or touches; *only facts as observed or reflected upon yield things, souls, life, judgments or feelings.* Hence the opposite of Munsterberg's contention is nearer the truth. Furthermore, the whole standpoint we are dealing with, is forced and does not go deep enough. The world is one, and *living, feeling, appraising*, cannot consistently be put in antagonism to *observing*. In appraising, for instance, as immediately given, we have a few sounds and feelings to which, under the particular circumstances, we attach the name of "appraising." (Sec. 71.) Münsterberg's theory fails, because he starts with philosophy and not with facts.*

198.—PHYSICAL SCIENCE AND PSYCHOLOGY.

Psychologists have usually desired to discriminate between psychology and physics. Yet, excepting those who have reduced physics to a department of psychology, psychologists have allowed for the origination of sense materials by the senses and for the physical production of bodily movement, as well as for the neural facts of retention and association. They might safely have gone one step beyond, and traced physically the relation of want and satisfaction. The standpoint here is not very abstruse. Granting that the body is the best observable portion of that centre called the "self," we shall have no difficulty in obtaining, by means of a study of the body, the simplest possible description of the development of life. *To understand the body, is to fill in the countless gaps which we meet with in the smell scheme, the taste scheme, and the other schemes.* It will not, of course, be sufficient to inquire into the nature of the nervous system, for that alone would explain only bodily movement and the fact that some changes go on outside the body. Hence profound research into the contents and changes in primary and secondary systems must proceed simultaneously. *Psychology would thus embrace the study of the central nervous system together with the connected moving and modifying influences, and this in systematic connection with the sights, sounds, smells, etc., which are observable at the same time* (sec. 156). General psychology, at least, would only concern itself with the broadest outlines, with the most general facts and their most general relations, leaving special sciences to deal with the several features exhaustively. General physics, on the contrary, would investigate the nature of seen and felt bodies, approaching psychology in the study of light, heat, colour, etc.; but laying the main stress on the resistance feelings. Ultimately the two must merge into a comprehensive descriptive scheme; and meanwhile there is no fear that either physicist or psychologist will have doubts as to the proper sphere of their labours.

As against abstract physics may be placed abstract psychology. The latter science, like the former, would only deal with the most general characteristics appropriate to its sphere. In this sense psychology is wider and more abstract, farther removed from the concrete, than physics; in fact, it is the very opposite of the special sciences. In these we attempt to *exhaust* any single system of a class; in psychology we make no such attempt. Psychology wishes to explain the surface facts of any moment without concerning itself with the extensive history of what it contemplates. It occupies itself with what is *immediately* given, and only asks for the most general reasons. For instance, it investigates the peculiar nature of visual systems, and why they come and go; but it does not seek to know the nature of a spark or that of the clashing pebbles from which the spark proceeds. Its time area is the present, and that is why it deals only with what is immediately given and why it makes no attempt to exhaust any system. In the special sciences, on the contrary, we are not interested in these most general features. We try to exhaust a system by following its endless ramifications, heedless of the barriers of space or time. In these cases we take for granted what is presented by psychology, and follow out the logical or systematic consequences in the primary and the secondary order.

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* Stout (*Psychology*, 1896, i, p. 159) writes: "The world of material phenomena, as regarded by the man of science freed from the animistic bias of common-sense, presents everywhere change, succession, transition, but nowhere *experienced* change, transition, or succession. . . . Transition in consciousness is, *eo ipso*, *experienced* transition." If Dr. Stout here implies that psychology cannot be objective like physics, *i.e.*, that the animistic bias of common sense is justified in psychology, then the criticism of Münsterberg's position holds good of his view. My contention is that the animistic theory has no more place in psychology than in physics.

When, therefore, we speak of an object, we usually understand by it some mediately given or exhausted system rather than a system immediately given or unexhausted. However, while the distinction is valuable, its limitations must not be overlooked; for the most immediately given and most unexhausted system is to some extent a system mediately given and exhausted. Nevertheless, in the rough, we may wisely distinguish between psychological and non-psychological systems. The latter we may again divide into exhausted tactile systems, the physics of to-day, and into exhausted systems generally—the science of to-morrow where the smell, sight and other systems will also be studied as mediately given and in connection with one another.

A division of systems into exhausted and unexhausted will cover some popular distinctions. Thus what I see and touch and smell this moment is not the flower; for the flower, in this case, is something regarded as exhausted and not as a passing and unexhausted system. In this sense the *object* of psychology and the *object* of physics are different, though the difference be only one of degree. As will also be seen from the psychological vocabulary, exhausted systems are divided into primary and secondary, or objects and notions, *e.g.*, books and knowledge.

199.—MONISM, DUALISM, ETC.

The problem of mind and matter has been one of the most stubborn ones which thinkers have taken in hand. Beset as it is with difficulties owing to the fact that early theories have warped the thought and twisted the language to their uses, these difficulties have been still further increased by persistent recourse to speculation instead of to scientific methods. In this state of affairs, it will require very considerable efforts to cut a way through the mountains of theory which obstruct the path of the pilgrim who is travelling truthward.

The one assumption which nearly all views on the subject seem to have in common, is that there is some reconciliation to be effected. The unanalytical man in the street admits a dualism or a pluralism; and to him it is as indisputable that there is a self as that there is a world and other selves. Not so with those who have pondered over the problem; not one of these agrees with the man in the street. To Berkeley the world is a series of pictures placed by God before the eye of man. Hume recognises only sensations in combination. Reid, while pretending to agree with common sense, denies the world all reality as common sense conceives it. Kant introduces a phenomenalism and noumenalism; while Spencer, who rails at these philosophers, ends by proposing a "transfigured" realism.

Herbert Spencer (*Psychology*, 1896, ii) frankly admits a dualism. "That which distinguishes psychology from the sciences on which it rests, is, that each of its propositions takes account both of the connected internal phenomena and of the connected external phenomena to which they refer" (p. 132). "From the science which discovers by introspection the laws of this something [mind], there is no passage by transitional steps to the sciences which discover the laws of these other [material] things" (p. 140). "The antithesis of subject and object, never to be transcended while consciousness lasts, renders impossible all knowledge of that ultimate reality in which subject and object are united" (p. 627). "Under its most general aspect, therefore, all mental action is definable as the continuous differentiation and integration of states of consciousness" (p. 301). Spencer discusses this subject fully in part 7; but most inconclusively in my opinion. The taint of the supernaturalism of his earlier years is still visible in his "transfigured" realism. James is, as usual, fresh, saying that the mind is "an organ added for the sake of steering a nervous system grown too complex to regulate itself" (*Psychology*, 1890, i, p. 144). When, we ask, did the pilot step on board? Fouillée ("Des Idées-Forces," *Rev. Phil.*, 1890, p. 137) writes as follows: "A determinism which claims to be universal, has no right to disdain anything as accidental, added, superfluous and epiphenomenal; there are no epiphenomena, there are only phenomena all equally necessary and reciprocally determined; everything is caused and causing, bound and binding, acting and acted upon, determined and determining: even my shadow is as necessary as my body, and, in fact, as real." So in his *Psychologie des Idées-Forces*, 1893: "The phenomenon called external is at bottom one with that called internal" (i, p. xiv); and "Internal observation is at bottom the same as external observation" (i, p. xxxii). See also his *Evolutionnisme des Idées-Forces*, 1890.

One of the most popular solutions is quasi-monistic. As Prof. Bain expresses it: "The one substance, with two sets of properties, two sides, the physical and the mental—*a double-faced unity*—would appear to comply with all the exigencies of the case" (*Mind and Body*, 1874, p. 196). Or as Prof. Lloyd Morgan puts it: "Monism regards nature and experience as one and indivisible, and all apparent dualism, as a dualism of aspect, distinguishable in thought, but indissoluble in existence" (*Comparative Psychology*, 1894, p. 9). This one substance with two aspects is evidently two substances masked by bold figures of speech. It is as though we referred to two parallel lines as one line with two aspects, or as if we added a third line of which those two lines were properties. The chief criticism, however, is based on the simple data: there we find no exact correspondence between two classes of facts, nor two classes at all; we only encounter a single unitary world where the solution has no place. In a strain similar to that of Bain, Huxley writes: "If we analyse the proposition that all mental phenomena are the effects or products of material phenomena, all that it means amounts to this; that whenever those states of consciousness which we call sensation, or emotion, or thought, come into existence, complete investigation will show good reason for the belief that they are preceded by those other phenomena of consciousness to which we give the names of matter and motion" (*Hume*, 1879, pp. 80-1). Here we have two assumptions (1) that there exist not things or systems but states of consciousness, and (2) that the phenomena of the material world are distinguishable from sensations and precede the latter. If by states of consciousness be meant merely things or systems,—trees, pains, etc.,—the phrase is unobjectionable; but if something else be implied, then our analyses compel us to dissent. Again, to claim precedence as between sensations and other phenomena is as though we should say that in entering a room the limbs (part of the man) precede the man (every part of the man). Physical phenomena are sensations or primary systems, and hence cannot explain sensations as such. Psychophysical parallelism swarms with these so-called parallels which are the same class of thing counted twice over. Indeed, this unsatisfactory parallelism is the monism now in vogue.

Followers of Kant who are eager to prove God, the soul, and freedom —followers such as Prof. Ward—have attempted to turn their master's flank, by saying that the phenomenal world is the result of an apperceptive process; that without Subject there is no Object. In a sense this position is based on later researches; but it leaves the principal questions untouched. If presentations are not part of the Subject, as Ward contends; if the presentation continuum be not the Subject itself, then we have still the Subject, which is admittedly unanalysable, and something beside. In other words, while there can be no husband without a wife and, by hypothesis, no Object without a Subject, yet that proves not unity but relationship or dependence, and we have still left a dual universe no more closely connected than Kant's phenomena and noumena. Only with the reduction of Subject to Object or Object to Subject, or by their resolution into what is common to them, or by their rejection as fictitious, can we obtain a unitary conception; to argue for duality in unity, as Prof. Ward does, instead of for dualism, is to rely on a neat wording for the solution of a difficulty.

Dr. Stout (*Manual*, 1898, ch. 3) urges a theory which assumes psychophysical parallelism. He suggests that the stream of individual consciousness is part of an immaterial system, and that the stream of material appearances has the same origin. Within that immaterial system, to which consciousness and phenomena are traced back, the individual consciousness is a determining factor: within this system it acts and is acted on. To this system, "in some way" percepts or primary compounds are due, and, it is held, that we are nearer the truth in speaking of it as consciousness, than in speaking of it as matter. This theory suffers from fatal defects. It is based first on a dubious parallelism, since the grey substance of the cortex is as much a visual sensation as is a seen house; and it then assumes some unitary world, different in kind from the one we know, where action and reaction actually take place. How can we, however, escape the conviction that the phenomenal worlds *are*, and if so, have we not three worlds instead of two? And lastly, how does this immaterial world, *different in kind*, come to give birth to two worlds of appearances; and ignoring this difficulty, whence do we obtain the phenomenal parallelism except by a parallelism in the immaterial world, for is it not acknowledged that there must be two noumenal somethings to correspond to the assumed two phenomenal somethings? Furthermore, how can we speak of this non-phenomenal world, after all Kant's warnings, as being nearer to mind than to matter or as causal or as acting? This see-saw reaction from a crude materialism to a crude psychologism seems, on the whole, a doubtful advantage, and certainly gives no indication of an advance towards the solution of a tantalisingly subtle problem.*

Kant brought forward his Critique (*Kritik der reinen Vernunft*, 2nd ed., 1787, preface), as the final word on the subject we are discussing. He repeatedly contended that no successor could possibly introduce improvements into his system. So perfect did he believe his Critique to be that he denied the possibility of his having overlooked anything. As the present work is purely that of a pioneer, I make the opposite claim, *i.e.*, that the notions on the points here raised are most imperfect. The task is more than can be carried out by one individual who has many problems before him. Only this, I think, seems established, that all parallelistic and dualistic theories are based on a confused analysis.

Some may demur to treating the problem of monism in a work on psychology. Such objectors occupy a false position, for they assume that it is the business of speculators to peg out claims, retaining for themselves all that is of value in the field which is to be prospected. I, however, recognise in the realm of science neither speculator nor warden of the gold-fields, and I, therefore, protest against a philosophy which proceeds by speculation and lays down the law to investigators. I must repeat, what I have often said, that hypotheses can bring us but a very little in advance of facts, and that independently of scientific research, hypotheses are of no use. Hence, while a piercing intellect has frequent opportunities of collecting, collating and combining limited generalisations, there is no room for any science of things as yet. Such a science could only be dreamt of in the far past, when the narrow range of speculation and the wide range of the unexplored were still unsuspected.

200.—A BIRD'S EYE VIEW.

The abrupt division between mind and body, or spirit and matter, is fatal to the psychologist who wishes to obtain a comprehensive view of his department of knowledge. On examination, however, he finds that that division is unjustifiable. He discovers that the eye, for instance, is not the initiator of visual systems, since it is itself a system of that class; and that accordingly the sensations or primary systems cannot be due to the sense organs, since the latter are themselves sense complexes. Similarly he notes that all systems are reducible to the same simple class and are fundamentally alike, and that the differences in their actual human stage of development are theoretically immaterial. Remaining faithful to his method of investigating the facts themselves, the psychologist finally learns that the data of existence form a single plane, and this forces on him a unitary, as opposed to a dualistic or pluralistic interpretation of nature and existence. Hence results a monism, pure and simple, having but one aspect.

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* Stout's view scarcely differs from that of Lotze as described in the latter's *Medicinische Psychologie*, 1852, pp. 79-80.

PART III

SPECIAL SYNTHESES

CHAPTER IX

SYSTEMS AS INDIVIDUALISED

Power in this is mainly shown:
Others' wit to make our own.

201.—THE IMMEDIATE RELATION OF THE INDIVIDUAL TO HIS ENVIRONMENT.

In sec. 97 I referred to the fact that man's originality is restricted within narrow boundaries. In this chapter I intend to treat the subject exhaustively, and show what amount of truth or error underlies the doctrine of the spontaneity of the soul. I purpose defining, as far as possible, the psychological relation in which the individual stands towards his fellows and towards his past self, for both from a theoretical and a practical standpoint it is desirable that the issue should be resolved.

To give our discussion a concrete basis, I will examine in detail Shakespeare's *Sonnets*, after which I shall try to prove that what I have stated of Shakespeare in particular holds good of humanity in general. Here is the 116th sonnet as an illustration of the class to which it belongs:

"Let me not to the marriage of true minds
Admit impediments. Love is not love
Which alters when it alteration finds,
Or bends with the remover to remove:
O, no! it is an ever-fixèd mark
That looks on tempests and is never shaken:
It is the star to every wandering bark,
Whose worth's unknown, although his height be taken.
Love's not Time's fool, though rosy lips and cheeks
Within his bending sickle's compass come;
Love alters not with his brief hours and weeks,
But bears it out even to the edge of doom.
If this be error and upon me proved,
I never writ, nor no man ever loved."

202.—SHAKESPEARE AND THE SONNET.

The notion of sonnet writing did not originate with Shakespeare. When we study his age, and especially the last decade of the sixteenth century, we find that sonneteering was the rage. Watson, Spenser, Daniel, Drayton, Griffin, Smith, Lodge, Fletcher, Constable, Barnes, Chapman, and others, all published collections of sonnets between about 1590 and 1600. Sir Thomas Wyatt and the Earl of Surrey were among the first to experiment in England with this poetic form, and Sidney and Spenser, with many more, made it popular.

Here is a list of Elizabethan sonnet writers. Anonymous, *Zepheriah*, 1594, 40 sonnets (Arber's *Garner*, v). Barnes, *Parthenophil*, 1593, 104 sonnets (*The Poems of Barnabe Barnes*, 1875). Barnfield, *Cynthia with Certaine Sonnetts*, 1595, 20 sonnets (*Complete Poems of Richard Barnfield*, 1876). C., J., 1595, 103 sonnets of 6 lines each (Arber's *Reprints*, iv). Chapman, *A Coronet for his Mistress Philosophy*, 1595, 10 sonnets (*The Poems of George Chapman*, 1875). Constable, *Diana*, 1594, 68 sonnets (Crow, *Elizabethan Sonnet Cycles*, 1896); and *Spiritual Sonnets*, 1595, 17 sonnets (*The Poems and Sonnets of Henry Constable*, 1897). Daniel, *Delia*, 1594, first ed. 1592, 67 sonnets. Davies of Hereford, *Dedicatory Sonnets*, 1603, 35 sonnets (*Works*, 1878, i, pp. 95-101); and 149 sonnets (*Works*, ii, pp. 6-28). Donne, *Philomel*, 1602, 10 sonnets (*The Complete Poems of John Donne*, 1873). Drayton, *Idea*, 63 sonnets, first ed. 1594, (Arber's *Reprints*, vi). Fletcher, *Licia*, 1593, 52 sonnets (Crow, *Elizabethan Sonnet Cycles*, 1896). Greville Fulke Lord Brooke, *Caelica*, before 1586, scarcely to be called sonnets (Crow, *Elizabethan Sonnet Cycles*, 1898). Griffin, *Fidessa*, 1596, 62 sonnets (Crow, *Elizabethan Sonnet Cycles*, 1896). Harvey, 1592, 22 sonnets (*The Works of Gabriel Harvey*, 1884-5). L[inch], *Diella*, 1596, 39 sonnets (Arber's *Garner*, vii). Lodge, *Phillis*, 1595, 40 sonnets (Crow, *Elizabethan Sonnet Cycles*, 1896). Percy, *Coelia*, 1594, 20 sonnets (Arber's *Garner*, vi). Sidney (d. 1586), *Astrophel and Stella*, 110 sonnets (*The Complete Poems of Sir Philip Sidney*, 1877). Smith, *Chloris*, 1596, 50 sonnets (Crow, *Elizabethan Sonnet Cycles*, 1896). Spenser, *Amoretti or Sonnets*, 1595, 88 sonnets (*Poetical Works of Edmund Spenser*, 1880). T[ofte], *Laura*, 1597, 120 sonnets (Arber's *Garner*, viii). Watson (d. 1592), *The Passionate Century of Love*, 1582, 100 sonnets; and *The Tears of Fancie*, 1593, 60 sonnets (Arber's *Reprints*, No. 21).

Shakespeare's sonnets indicated, therefore, no spontaneous outburst on his part. In choosing to address his friend, and in selecting the sonnet as his medium, he did what a host of others were doing. As the corn bends with the wind which sweeps across it, so the wizard breath of fashion is irresistible, most of us yielding to its impulse. Seeing his fellow poets pour out their souls in cycles of sonnets, entering into these productions till he became saturated with their spirit, and being himself in the throes of a passion, what other course could he take but join the choristers? The *vis a tergo* of fashion is despotic. We meet its expression so continuously and persistently morning, noon and night that, struggle as we may, we are compelled to surrender. There are none who escape this power wholly, and there are few who are not its bond-servants. Shakespeare, then, obeyed the spirit of his period when he ventured on writing sonnets. Indeed, it was a mark of his character, perhaps even more than of his time, to imitate his contemporaries.

Crow (*Elizabethan Sonnet Cycles*, 1896) says in the introduction to Daniel: "Shakespeare's sonnets are full of echoes from the voices of Sidney, Constable, Davies, Lodge, Watson, Drayton, and Barnes, as well as from that mellifluous one of Daniel" (pp. 3-4). So Lee, *A Life of Shakespeare*, 1899, pp. 109-10: "The thoughts and words of the sonnets of Daniel, Drayton, Watson, Barnabe Barnes, Constable, and Sidney were assimilated by Shakespeare in his poems as consciously and with as little compunction as the plays and novels of his contemporaries in his dramatic work." See his section on *The Vogue of the Elizabethan Sonnet*, pp. 427-41.

203.—SHAKESPEARE AND THE SONNET FORM.

We are not concerned with the evolution of the Italian or French sonnet and its transference to, and development in, English soil.* All that we are bound to note is that the literature of Italy and France was extensively studied, translated and taken as a model, by the literary men of the sixteenth century in England. To that tendency we owe our sonnet. Many were the changes in form that it subsequently passed through. On the whole, however, one form was by far the most general among the Elizabethans, being employed by the Earl of Surrey, by Daniel, Drayton, Smith, Lodge, Fletcher, and others. When Shakespeare wrote his quatorzains that was the ruling form, and so he straightway adopted it. Here is an early specimen by the Earl of Surrey (d. 1547):

> "The golden gift that Nature did thee give,
> To fasten friends and feed them at thy will
> With form and favour, taught me to believe
> How thou art made to show her greatest skill:
> Whose hidden virtues are not so unknown
> But lively dames might gather at the first;
> Where beauty so her perfect seed hath sown,
> Of all other graces follow needs there must.
> Now certes, Lady, since all this is true,
> That from above thy gifts are thus elect,
> Do not deface them then with fancies new,
> Nor change of minds let not the mind infect:
> But mercy him, thy friend, that doth thee serve,
> Who seeks always thine honour to preserve."†

Comparing this typical sixteenth century sonnet with the one we have quoted from Shakespeare, we see how unreservedly he adopted the current form. In both instances the number of lines is fourteen. In both instances the rhymes are alternate in the first twelve lines. In both instances the poem ends with a couplet which tends to sum up the argument of the preceding twelve lines. In both instances the lines are all decasyllabic. There is an apparent difference in that Shakespeare occasionally makes his lines end in a short syllable, an eleventh; but, as a matter of fact, all the sonnet writers allow themselves this deviation from the normal. There are other striking structural resemblances. There is with the sonneteers a tendency for their lines to run very smoothly. The sentences are almost uniformly short and forcible, ending usually with the rhyme, and it is rare for full stops to occur in the middle of the line. This contrasts with the modern sonnet in which the sentences are long and involved, and where little regard is paid to music as expressed by a feeling for the metre and the rhythm, so that they read like cumbersome blank verse. The student may with advantage compare the sonnet of the nineteenth with that of the sixteenth century. Here is Wordsworth's sonnet, "Scorn not:"

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* See Lee's learned *Bibliographical Note on the Sonnet in France*, 1550-1600, on pp. 442-5 of the quoted work.

† "The whole period from Wyatt to Shakespeare shows a slow and steady mastery of the native over the foreign tendency. The change was not a sudden leap on the part of Daniel and Shakespeare, but a gradual growth occupying a half century and culminating in the English form" (Crow, *Elizabethan Sonnet Cycles*, Introduction to Daniel, p. 5).

Here is an analysis of the sonnet form in the twenty-two authors quoted. Anonymous: the placing of rhymes varies; but many sonnets have the same form as Shakespeare's. Barnes: many of 15 lines, and rhymes irregular. Barnfield: rhyme a b b a c d d c e f f e g g. C. J.: a b a b c c (only six lines). Chapman: rhymes as Shakespeare's. Constable: a b b a a b b a c d c d e e. Daniel: rhymes vary; but generally as Shakespeare's. Davies, rhymes as Shakespeare's. Donne: rhymes as Shakespeare's. Drayton: rhymes chiefly Shakespearian. Fletcher: rhymes as Shakespeare's. Greville, Lord Brooke, rhymes undecided. Griffin: rhymes as Shakespeare's. Harvey: rhymes vary. L[inch:] rhymes as Shakespeare's. Lodge: rhymes as Shakespeare's. Percy: rhymes as Shakespeare's. Sidney: rhymes vary. Smith: rhymes as Shakespeare's. Spenser: a b a b b c b c c d c d e e. T[ofte], a b a b c c doubled, and a b a b c d c d e e, these two forms alternating. Watson: (early sonnets) three sets of a b a b c c, making 18 lines; and (later sonnets) as Shakespeare.

"Scorn not the sonnet; critic, you have frowned,
Mindless of its just honours;—with this key
Shakespeare unlocked his heart; the melody
Of this small lute gave ease to Petrarch's wound;
A thousand times this pipe did Tasso sound;
Camöens soothed with it an exile's grief;
The sonnet glittered a gay myrtle leaf
Amid the cypress with which Dante crowned
His visionary brow; a glow-worm lamp,
It cheered mild Spenser, called from faery-land
To struggle through dark ways; and when a damp
Fell round the path of Milton, in his hand
The thing became a trumpet, whence he blew
Soul-animating strains—alas, too few!"

The difference between the technique and the spirit of this sonnet and of the one quoted from Shakespeare indicates not two individuals, but two epochs. The reader who is acquainted with no other Elizabethan poet but Shakespeare must be careful not to consider as characteristic of him alone what is really a badge of the period. The sixteenth century sonneteers whose names we have mentioned wrote in much the same strain. What differences there were, consisted in stronger leanings in certain directions; that is to say, various writers accentuated various tendencies.

204.—PECULIAR SONNETS.

We have insisted that Shakespeare's sonnet, its music, its perfume, its splendour and its delicacy, was no creation of his own. Its atmosphere betokens an epoch, not a man.

Among the sonnets we are analysing there are several which are curiously affected and over-subtle. It might seem that these were native to our poet.

As a matter of fact, he but followed the fashion, often apparently going so far as to adapt another's work. Compare his 46th sonnet:

"Mine *eye* and *heart* are at a mortal war
How to divide the conquest of thy *sight*;
Mine *eye* my *heart* thy picture's *sight* would bar,
My *heart* mine *eye* the freedom of that right.
My *heart* doth plead that thou in him dost lie,
A closet never pierced with crystal *eyes*,
But the defendant doth that plea deny
And says in him thy fair appearance lies.
To 'cide this title is impannelléd
A quest of thoughts, all tenants to the heart,
And by their verdict is determinéd
The clear *eye's* moiety and the dear *heart's* part:
As thus: mine *eye's* due is thy outward part,
And my *heart's* right thy inward love of *heart*."

with Constable's (*Diana*, Sixth Decade, sonnet 7):

"My *heart* mine *eye* accuseth of his death,
Saying his wanton *sight* bred his unrest;
Mine *eye* affirms my *heart's* unconstant faith
Hath been his bane, and all his joys repressed.
My *heart* avows mine *eye* let in the fire,
Which burns him with an everlasting light.
Mine *eye* replies my greedy *heart's* desire
Let in those floods, which drown him day and night.
Thus wars my *heart* which reason doth maintain,
And calls my *eye* to combat if he dare,
The whilst my soul impatient of disdain,
Wrings from his bondage unto death more near;
Save that my love still holdeth him in hand;
A kingdom thus divided cannot stand!"

Compare with the above two poems, Watson's sonnet 20, 1593:

"My *heart* accused mine *eyes* and was offended,
Vowing the cause was in mine *eyes* aspiring:
Mine *eyes* affirmed my *heart* might well amend it,
If he at first had banished love's desiring.
Heart said that love did enter at the *eyes*,
And from the *eyes* descended to the *heart*:
Eyes said that in the *heart* did sparks arise,
Which kindled flame that wrought the inward smart,
Heart said *eyes'* tears might have quenched that flame,
Eyes said *heart's* sighs at first might love exile:
So *heart* the *eyes* and *eyes* the *heart* did blame,
Whilst both did pine for both the pain did feel.
Heart sighed and bled, *eyes* wept and gazed too much,
Yet must I gaze because I see none such."

The resemblance between the three sonnets is too great to be accounted for by accident. With this, however, we have nothing to do, the point being that wherever there is a change in the style of sonnets, as in sonnets 39, 40, 42, 45, 47, 66, 134-136, it is not difficult to find a model for the new style in the work of his predecessors. Deviations from the normal in the poems must not, therefore, be construed as original conceptions. Shakespeare's weaknesses are those of his times. As silly sheep follow each other unreasoningly, so he, in imitation of others, often allowed himself to be caught in the meshes of an over-subtle style.

205.—SHAKESPEARE'S LANGUAGE.

A peculiarity, and not by any means an unimportant one, in Shakespeare's style is his use of unconventional, vigorous and thoughtful adjectives. Some of the depth and virility of his manner lies in these, and they also separate him from modern poets. Thus he employs the word Time eleven times with an adjective before it, as follows: "golden time," "never-resting time," "wasteful time," "devouring time," "swift-footed time," "old time," "dear time," "sluttish time," "wasted time," "inviting time," "reckoning time." Such adjectives give a ducal richness to the sentences in which they occur. They convert what would otherwise be personal and particular into what is impersonal and universal. Here is a further selection from the sonnets: "Reckoning time whose millioned accidents," "an all-eating shame and thriftless praise," "hideous winter," "winter's ragged hand," "hideous night," "sable curls," "sullied night," "stretchèd metre of an antique song," "swart-complexioned night," "sullen earth," "swift extremity," "dull flesh," "blunting the fine point of seldom pleasure," "than unswept stone besmeared with sluttish time," "all-oblivious enmity," "world-without-end hour," "keep open my heavy eyelids to the weary night," "beaten and chopped with tanned antiquity," "time's injurious hand," "age's steepy night," "against confounding age's cruel knife," "time's fell hand," "outworn buried age," "hungry ocean," "the firm soil wins of the watery main," "against the wreckful siege of battering days," "captive good attending captain ill," "the surly sullen bell," "niggard truth," "filching age," "mouthèd graves," "time's thievish progress," "heavy ignorance," "rude ignorance," "my saucy bark," "time-bettering days," "lean penury," "in polished form of well-refinèd pen," "ungathered fruit," "teeming autumn," "proud-pied April," "white despair," "resty Muse," "steelèd sense," "adder's sense," "vexed oblivion," "tongue-tied patience," "testy sick men," "cunning love."

From no other series of sonnets or poems of the same length could probably such an abundant harvest be gathered. One has only to attempt to find adjectives of this character within one's own self to see how our thought vainly strives to escape the beaten path of custom. We see in them an effort to emancipate oneself from listless or slavish thinking. However, our interest lies in other directions. We want to know whether the difference in this respect between us and Shakespeare, is as great as that which existed between him and his contemporaries. Our answer cannot be as decided here. The notion of throwing off the shackles of poverty-stricken custom is not traceable to him. Spenser's *Fairy Queen* is replete with adjectives of this very class, and others of his contemporaries are not unaffected by the charm. Shakespeare is, therefore, not original in this respect. Still, no other sonneteer of his time made such extensive use of expressive adjectives. He adopted the style, but increased its scope. We read in Griffin of "all-withering age," "injurious fates," "all-reporting fame," "killing grief," "traitor absence," "never-speaking silence," "ever-flying flame," "all-concealing night," "men-devouring wrong," "soul tormenting grief;" and in Daniel we read of "cruel time," "time's consuming rage," "tyrant time," "swift speedy time," "unsparing time," "sacrilegious time," "golden hairs shall change to silver wire," "mercy-wanting storm," "care-charmer sleep." On the whole, however, significant adjectives are employed casually, not systematically.

What has been said as to adjectives is true also of other important parts of speech. Their value in the sonnets is often unmistakable, while, at the same time, they tend to give weight and dignity to many of the sentences and thoughts. In these details of Shakespeare's style he cannot be called original, though undoubtedly he recognised their usefulness to a greater extent than most of his contemporaries. In that, and in that alone, lay his pre-eminence. His claim to inventiveness must be dismissed.

The 116th sonnet, already quoted, is a good illustration of Shakespeare at his best, and he is that frequently. We must re-member in this connection that there is no necessary relation between poetry and imagery. French verse up to the nineteenth century was, if I mistake not, almost devoid of it. Poetry may reach a tolerably high level, and yet be almost entirely wanting in this element. Taking versification as a whole, we find specimens of every variety of colouring from monotonous grey to rosy luxuriousness, each period of history having usually a tendency of its own. The sonnet of Wordsworth which we cited is fairly typical of modern poetry, allowing for Keats and Shelley. Even more true to their period are the sonnets whose psychological origin we are endeavouring to trace. They, too, offer, as regards imagery, a faithful picture of the Elizabethan times. Both in matter and manner they reveal their birth-place. If we had no other guide to the time of their composition, the secret of their imagery would place them, for at no other date was poetic painting of just this kind, and never did child betray its parentage so clearly as the colouring of the sonnets discloses the Elizabethan touch. Strictly speaking, it was not Shakespeare's soul that charactered in ink these lofty conceits; it was the inventive spirit of his time.

Elizabethan imagery is distinguished by wealth and character. Richness of colour, however, is in itself no virtue, for many a writer is florid, and yet lacks merit. He threads on strings a quantity of hackneyed and feeble illustrations; or invents what of itself is malapropos, uninteresting and poor; or he is bound within a small compass, so that we can almost divine what form his fancy will take. Breadth, depth, vigour, grandeur, mark the best Elizabethan word-painters, and these qualities we meet with in

Shakespeare. The moulder of stanzas who communes only with himself and is dead to the throbbing world; to whom nature, history, art, science, commerce, the home, are pale abstractions, cannot fascinate our imagination. The Elizabethan poetry reflects the Elizabethan life, its liberal interests and its thirst for action.

So much for Shakespearean imagery in general. Foremost in quantity in the sonnets stands the conception of time and its derivatives, age, death, night, sun and season. I have already referred to the fact that in the first 126 sonnets the word Time is used with an adjective before it eleven times. A close study reveals that Time is personified no less than forty-eight times in these poems, and is employed altogether seventy-three times. Whole sonnets are devoted to it, as 19, 64, 65 and 123, though this does not exhaust the central conception. The frequent references to death, age, the periods of the day, the seasons, are variations of the same theme. The poetic handling of this conception on so large a scale can only be defended on the ground of effectiveness, and, judging from modern poetry, one would think it impossible that a notion should not have died of anemia long before it was personified for the forty eighth time. However, only those spiritually sapless will think so. To an Elizabethan, Time was a concept which grew in attractiveness before his eyes the longer he gazed on it. Use did not wear it out; it only unfolded its implications. It was a notion which Shakespeare had employed before, and which he never wearied of returning to afterwards. In the nature of things, time and its family are leading conceptions in every strong nature which is not habit-ridden. They are the matrix in which the tissue of our existence is embedded, and only the poverty of our thought limits the richness of their inner meaning.

This poetic simile of Time did not orginate with Shakespeare, for it is an old and favourite personification. In Daniel's sonnets the allusions to the subject are not infrequent. We find there "cruel time," "time's consuming rage," "tyrant time," "time bestows," "time do spoil her," "time hath made a passport," "swift speedy time," "to spend the April of my years," "no April can revive." The likeness in thought is conspicuous; and if Daniel's reflections are less frequent, there is yet one unmistakable current underlying the works of both poets. So Sidney: "niggard time," "stealing time."

Drayton is fond of this word, witness: "time's flying hours," "time's defect," "time's sacrilegious rapine," "his utmost date," "time might work," "time's spirit," "by the locks he haleth aged time," "time on his life thy gathered store disperse," "timeless death," "time offers," "time," "time still reads," "o'erworn wrinkled age," "this Edward in the April of his age," "restless time that never turns again," "time's pestilence," "time-fawning spaniels," "time festers and time mourns," "time's old transgression," "world-devouring time" (*The Tragical Legend of Robert, Duke of Normandy* [etc.], 1596). So Barnes: "Time's cancer," "devouring time."

The subject which stands next in quantitative importance to time, is that of law. This is startling, and deserves a special explanation. Shakespeare's allusions, like those of his great contemporaries, are culled from so large a field that occasional references to law should not surprise us; but the question assumes the dimensions of a problem when it is found that law all but holds the first place. The two selected sonnets are pointed illustrations of this. The first one starts in dry legal phraseology: "Let us not to the marriage of true minds admit impediments." The other sonnet is more remarkable still. It reads like a brief full of legal technicalities; and yet Constable's poem has not a trace of this element, though it is otherwise its double. There are references to law in a large number of the sonnets.

Here we strike on something which cannot apparently be traced to Shakespeare's professional environment. Given occasional allusions in his contemporaries (Compare "that beauty which you hold in lease," with Daniel "in beauty's lease expired"; also in the same writer "cast th' accounts," "summon," and possibly other similarities), and we discover the plank over which Shakespeare passed to the abundant use of legal imagery. Uncontrolled circumstance was probably the leading factor.

The circumstance is not so inexplicable as the text supposes. For instance, sonnets 20, 37, 38, in Anonymous, *Zepheriah*, are legal in character; No. 20, in Barnes' *Parthenophil*, has legal metaphors: "tenants," "freehold," "in tenour of love's service," "exaction," "rent"; sonnet 5, in Griffin's *Fidessa*, belongs to the category of law; Sidney's *Stella*, sonnet 18, has: "audit," "accounts," "bankrout"; and, lastly, Lee, in his *Life of Shakespeare*, quotes Sir J. Davies as ridiculing the frequent use of law in the sonneteers of his time.

Apart from Time and Law, the similes in the sonnets are taken from nature, music, painting, the stage, war, the Court, friendship, love, home, disease, avarice, the sea, navigation, the Muses, the dial and the mirror. Many of these subjects, as those implied in nature, the sea, painting, the mirror or glass, occur repeatedly; and all of them are favourite subjects of the Elizabethans.

So-called Shakespearean imagery is not uncommon with his contemporaries. Most of them remind us of him who expressed them generally best. Witness Daniel:

"The broken tops of lofty trees declare
The fury of a mercy-wanting storm."

Or

"The ocean never did attend more duly
Upon his sovereign's course, the night's pale queen,
Nor paid the import of his waves more truly,
Than mine unto her deity have been."

Or (of England)

"Neptune's best darling, held between his arms."

Or, to quote Constable:

"Care, the consuming canker of the mind
The discord that disorders sweet hearts' tune!
Th' abortive bastard of a coward mind!
The lightfoot lackey that runs post by death,
Bearing the letters which contain our end!
The busy advocate that sells his breath,
Denouncing worst to him, is most my friend!"

There is in this last passage something peculiarly characteristic of all that can be said of Shakespeare. Here is his breadth, his depth, his simplicity, his music and his vigour! Extracts might be largely multiplied; but the above quotations must suffice.

Or, "Come, sleep! O sleep, the certain knot of peace,
The baiting-place of wit, the balm of woe,
The poor man's wealth, the prisoner's release,
Th' indifferent judge between the high and low."
Sidney, *Sonnet* 39.

Or, "Thou blind man's mark, thou fool's self-chosen snare,
Fond fancy's scum, and dregs of scattered thought:
Band of all evils: cradle of causeless care;
Thou web of will, whose end is never wrought:
Desire! desire! I have too dearly bought,
With prise of mangled mind, thy worthless ware."
Sidney, *Sonnet* 109.

Or, "The marigold so likes the lovely sun,
That when he sets the other hides her face,
And when he 'gins his morning course to run,
She spreads abroad and shows her greatest grace."
Watson, 1582, *Sonnet* 19.

Or, "When May is in his prime, and youthful spring
Doth clothe the tree with leaves, and ground with flowers,
And time of year reviveth everything;
And lovely nature smiles, and nothing lowers:
Then Philomela most doth strain her breast
With night-complaints, and sits in little rest."
Watson, 1582, *Sonnet* 26.

A peculiarity of Shakespeare is that he not only writes like his fellows, but also makes free use of their productions. Often there is no more than a strong likeness, suggesting the source of the line or sonnet, but frequently there is no reasonable doubt as to their origin. I can only give a few quotations in illustration. In the sonnets we find:

"Distilled from limbecks foul as hell within,"

In Spenser we read:

" . . the dull drops . . . .
As from a *limbeck* did adown *distil.*"

In Barnes:

"From my love's *limbeck* still, '*stillest* tears."

In Lodge:

"The *limbeck* is mine eye that doth *distil* the same."

While Spenser speaks of "lofty trees, yclad with *summer's pride*," Shakespeare tells us that

"Three winters co[illegible]
Have from the forests shook three *summers' pride.*"

Thus Lilly, praising the lark, says:

"How at *heaven's gates* she claps her wings,
The morn not waking till she sings."

And Shakespeare:

"Like to the lark at break of day arising
From sullen earth, sings hymns at *heaven's gate.*"

Many more such resemblances might be insisted on. Let us instead consider another class of parallels. Shakespeare repeatedly tells his friend, with variations:

"O, give thyself the thanks, if ought in me
Worthy perusal stand against thy sight."

So Sidney:

". . . . . in Stella's face I read
What love and beauty be; then all my deed
But copying is, what in her, nature writes."
"All my words thy beauty doth indite,
And love doth hold my hand and makes me write."

So Daniel:

"If any pleasing relish here I use,
Then judge the world her beauty gives the same."

Constable writes:

"I never will deny
That former poets *praise* the beauty of their days;
But all those beauties were but *figures* of thy praise,
And all those poets did of thee but *prophesy.*"

So Shakespeare:

"So all their *praises* are but *prophecies*
Of this our time, all you pre*figuring.*"

Similar resemblances we have noted previously. An intimate study of the Elizabethans would prove that our poet-in-chief was largely indebted to others for special images, conceits turns of phrases and ideas. He dwelt lovingly on the good things which he found in his predecessors. For instance, what could be prettier than the 99th sonnet (which, by-the-bye, has fifteen lines):

"The froward *violet* thus did I chide:
Sweet thief, whence didst thou steal thy *sweet* that *smells*
If not from my love's *breath?* The *purple* pride
Which on thy soft cheek for complexion dwells
In my love's veins thou hast too grossly *dyed.*
The *lily* I condemned for thy *hand,*
And buds of marjoram had stol'n thy hair:
The *roses* fearfully on thorns did stand
One *blushing shame,* another *white* despair;
A third, nor *red* nor white, had stol'n of both
And to his robbery had annexed thy breath;
But, for his theft, in pride of all his growth
A vengeful canker eat him up to death.
More *flowers* I noted, yet I none could see
But sweet or *colour* it had stol'n from thee."

Compare this with a sonnet of Constable's:

> "My lady's presence makes the *roses red*,
> Because to see her lips they *blush* with *shame*.
> The *lily's* leaves for envy pale became,
> And her *white hands* in them this envy bred.
> The marigold * the leaves abroad doth spread,
> Because the sun's and her power is the same.
> The *violet* of *purple colour* came,
> *Dyed* in the blood she made my heart to shed.
> In brief, all *flowers* from her their virtue take;
> From her *sweet breath* their *sweet smells* do proceed;
> The living heat which her eyebeams doth make
> Warmeth the ground and quickeneth the seed.
> The rain wherewith she watereth the flowers,
> Falls from mine eyes which she dissolves in showers."

206.—SHAKESPEARE'S INSIGHT.

Shakespeare's insight is universally acknowledged. It is as a thinker, that we wish here to learn something of him from the sonnets. Necessity does not ordain that epistles addressed to a friend or mistress should contain general reflections. Accordingly, many of Shakespeare's sonnets are entirely devoid of such; while those of his contemporaries confirm our contention. The value and weight of his cycle of poems depend almost entirely on the impersonal element, and but for that Shakespeare would not be great. We have already touched upon this side of his character when speaking of the luminous adjectives he uses and of his references to Time and its derivatives. And in the same connection we have seen that for Shakespeare cannot be claimed the merit of originality on that score. We noted nevertheless that what was comparatively rare in his models is a familiar strain with him. This is emphatically true of what is impersonal in the sonnets. Lacking as he may be in inventiveness, he yet almost changed the nature of his sonnets, perhaps slightly marred them, by his wholesale introduction of reflections. Where his compeers are absorbed in the object of their affection, he constantly looks upon his love as connected with general characteristics. He declines to dwell, perhaps he finds it impossible to do so, in the personal sphere. Suddenly he breaks out with:

> "O, love's best habit is in seeming trust,
> And age in love loves not to have years told."†

Or, "Love is too young to know what conscience is:
Yet who knows not conscience is born of love?"

In this way Shakespeare ever bursts through the narrow bounds of the personal. The 116th sonnet, which is quoted at the beginning of this chapter, may be taken as a choice specimen of his philosophising mood. To quote other examples would be superfluous.

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* Compare the lines on the marigold I have quoted from Watson with these two lines and the two quotations with the image in Shakespeare's sonnet 25:

> "Great princes' favorites their fair *leaves spread*
> But as the *marigold* at the *sun's* eye."

† The 1599 edition of this poem has "O, love's best habit is a soothing tongue," a very inferior line.

Animal species are not originated by a sudden fiat, but as the result of an exploitation of such slight variations as are favoured by the environment. No evolutionist, therefore, should be startled when he finds that Shakespeare did not come like a clap of thunder from the sky; but only showed certain modifications from his contemporaries. Great men do not constitute species; they merely raise a variety to that dignity by bringing it into prominence. Shakespeare's insistence on the universal rivets our attention on him, rather than on others who touch upon it incidentally. Strictly speaking, therefore, it is quantity and not quality which distinguishes him. Had there been but two or three of the sonnets written in a reflective vein, and only a dozen or two incidental impersonalities, the name of Shakespeare, as far as the sonnets are concerned, would have ranked with Daniel and other little known authors. It is the quantity of finer work which has rescued him from the clutches of neglect; or, to put the matter differently, had Daniel quintupled his general references and Shakespeare decreased his considerably, there is fair reason to believe that Daniel would have been our great sonneteer. In illustration of this, I will quote two of Daniel's sonnets to show the higher qualities in Shakespeare's compeers (*Sonnet* 30, 1594):

> "And yet I cannot reprehend the flight,
> Or blame th' attempt presuming so to soar,
> The mounting venture for a high delight
> Did make the honour of the fall the more.
> For who gets wealth that puts not from the shore?
> Danger has honour, great designs their fame,
> Glory doth follow, courage goes before,
> And though th' event oft answers not the same,
> Suffice that high attempts have never shame.
> The mean observer (whom base safety keeps)
> Lives without honour, dies without a name,
> And in eternal darkness ever sleeps.
> And, therefore, Delia, 'tis to me no blot,
> To have attempted, though obtained thee not."

And what seems Daniel's best (*Sonnet* 49, 1594):

> "Care-charmer sleep, son of the sable night,
> Brother to death, in silent darkness born;
> Relieve my anguish and restore the light,
> With dark forgetting of my cares return.
> And let the day be time enough to mourn
> The shipwreck of my ill-adventured youth:
> Let waking eyes suffice to wail their scorn,
> Without the torment of the night's untruth.
> Cease, dreams, the imagery of our day-desires,
> To model forth the passions of the morrow,
> Never let rising sun approve you liars,
> To add more grief to aggravate my sorrow.

Still let me sleep, embracing clouds in vain,
And never wake to feel the day's disdain '

Let me add one or two more quotations. Here is a sonnet from Watson (*Sonnet* 77, 1582)

" Time wasteth years, and months, and hours
Time doth consume fame, honour, wit, and strength.
Time kills the greenest herbs and sweetest flowers.
Time wears out youth and beauty's looks at length
Time doth convey to ground both foe and friend,
And each thing else but love, which has no end.
Time maketh every tree to die and rot
Time turneth oft our pleasures into pain
Time causeth wars and wrongs to be forgot
Time clears the sky which first hung full of rain.
Time makes an end of all humane desire,
But only this, which sets my heart on fire
Time turneth into naught each princely state.
Time brings a flood from new resolved snow
Time calms the sea where tempest was of late
Time eats whate'er the moon can see below
And yet no time prevails in my behove,
Nor any time can make me cease to love "

And here are three stanzas from Drayton to which scores of similar ones from the same author might be added Speaking of Fortune, he says (*Tragical*, etc 1596, stanza 37)

" A hap, a chance, a casual event,
The vulgar's idol, and a childish terror,
A what-not, a wild, silly accident,
The mask of blindness, and disguise of error,
Nature's vile miscreant, folly's foolish mirror;
A term, a byword, by the idle unlearned,
A heresy, nothing, not to be discerned '

Again (*Tragical*, etc, 1596, stanza 120)

" Fair memory, awaken Fate from sleep,
Call up time's spirit of passed things to tell,
Unseal the secrets of the unsearched deep,
Let out the prisoners from oblivion's cell,
Invoke the black inhabitants of hell
Into the earth's deep dungeon let the light,
And with fair day clear up the cloudy night "

Also (*Matilda*, 1596, stanza 155)

' Our fond preferments are but children's toys,
And, as a shadow, all our pleasures pass,
As years increase, so waning are our joys,
And beauty crazed, like a broken glass
A pretty tale of that which never was.
All things decay, yet virtue shall not die,
This only gives us immortality."

2[illegible]7 —THE OBJECT OF SHAKESPEARE'S SONNETS

I have said that Shakespeare was but one of the sonneteers of his age If we ask as to the object of Shakespeare's sonnets, we find that that also was determined for him. I cannot enter into the question of how far it was a new departure to send to a friend epistles such as are the sonnets 1 to 126. Careful study shows that while it was no custom among the Elizabethans to address a long sonnet cycle to a protector, yet it was quite in the spirit of his times. Platonic love and excessive admiration were in no sense uncommon in that age. The notion of passionate friendship, with its implications, is not originated or added to by him. The sonnet cycles of his time almost invariably had love for their motive. His expression of devotion, humility, prostrate dependence, yearnings and loyalty are the stock-in-trade of all his fellows. They vie with each other in the attempt to prove their passion to be sincere and great. Indeed, Shakespeare is often cold and distant compared with some of the other sonnet writers, as if his inspiration came in great and sudden rushes.

Elizabethan poets wrote sonnets as readily as commoner folk say "How do you do?" Just as, in a storm, we see rain-drops wherever we turn, so sonnets almost drench the literary atmosphere of 1590-1600. The very rage of the downpour, however, indicated that the shower would not last long.

Though most sonnet cycles were addressed to ladies, yet we have many exceptions. Barnes, Constable, Donne and others wrote cycles of spiritual sonnets. Chapman apostrophised his mistress Philosophy. Harvey composed a diatribe against Greene. Barnfield addressed the boy Love. And almost everybody wrote dedicatory and other epistles in sonnet form.

208.—The Place of Shakespeare's Sonnets.

Looking now at the sonnets as a whole, we shall find no difficulty in placing them. Broadly speaking, we may now say that they did not bubble up in Shakespeare's mind, regardless of time and circumstance. On the contrary, our investigation proved that he was essentially a man of his period, that he absorbed his manner and matter from his environment, and that he but painted the life and thought of his adventurous age. That which is striking in the sonnets we have been forced to place to the credit of the spirit which swept over the land towards the end of the sixteenth century, and wherever he excelled it was by virtue of being an Elizabethan. One who reads Shakespeare and knows him well, knows the spiritual stress and delights through which his country passed. He is a type, a representation, a personification of his times. He stands for the genius of the Elizabethan era much more than for his own superiority. Subtract what he derived from his contemporaries, and not even a bold shadow of the man remains. He who honours Shakespeare, and not his times, cannot know how absolutely he was its product and its avatar. He only accepted the torch which was handed to him, the time spirit confirming in him the apostolic succession of the church poetical. He was but a splendid variety of the splendid Elizabethan species, being supreme primarily because he was the son of a mighty age. A greater than Shakespeare could only come to a greater environment. With nothing but modern artificiality, pettiness and effeminacy about him, he would have remained an inconspicuous figure. He was fortunate in being hurled onto the rocks of fame by the tremendous force of the Elizabethan groundswell, for the impetus of his own nature was infinitesimal besides that given him by his era. He was the favoured child of the fates.

I have consulted the following authors on the subject of the sonnets: Bodenstedt, *Sonette*, 1862; Delius, *Abhandlungen*, 1878, pp. 1-47; Dowden, *The Sonnets of W. Shakespeare*, 1881; Dunning, *The Genesis of Shakespeare's Art*, 1897; Furnivall, *The Leopold Shakespeare*, 1877, lxiii to lxvii; Gervinus, *Shakespeare*, 1872, i, pp. 560-602; Massey, *Shakespeare's Sonnets*, 1872; Sharp, *Songs, Poems, and Sonnets of William Shakespeare*, pp. 1-36; Spalding, *Shakespeare's Sonnets*, 1878; Tyler, *Shakespeare's Sonnets*, 1890; and Wyndham, *The Poems of Shakespeare*, 1898.

209.—SHAKESPEARE AS DRAMATIST.

Shakespeare was, conventionally speaking, no more original in his plays than in his sonnets. It is superfluous to mention that we do not owe the drama to him. Similarly, the blank verse which he employed he found ready made. The important changes which that form of versification passed through from the time Lord Buckhurst made use of it in *Garboduc* to the point of its highest development, about the time of Shakespeare's death, were in the truest sense socially produced. There is no proof that the scantier employment of endline stops, the increase in midline stops, the use of weak endings, the subjugation of the metre to the delicate requirements of thought, the substitution of dignity for bombast, and the introduction of prose when simplicity was imperative, are traceable to any one person. The improvement was gradual and universal. There is not a scintilla of evidence to show that Shakespeare, or indeed any one else, took the lead.

It is a universal custom among writers on Shakespeare to speak of his predecessors—Lilly, Marlow, Kyd, Nash, Peele and Greene—and to compare his work with theirs.* The implication here is that with the passing of his predecessors the whole stream of dramatic literature was forced to flow through one channel, that of Shakespeare. Ridiculous as is this position; evident as it is that there were numbers of dramatists following Shakespeare's predecessors; we have only to advert to the facts to see the weakness of so many of the odious comparisons that fill the pages of works on Shakespeare. The sole critic, to my knowledge, who has attempted to deal fairly with the matter, I mean Hazlitt (*On the Age of Elizabeth*, 1821), wrote over eighty years ago.

The bard of Avon constructed his plays as his many fellow playwrights did. He refashioned and utilised old plays; he dramatised English and foreign prose tales; and he exploited Holinshed and Plutarch. He wrote now dramas and now comedies, and his busy pen was no more fertile than the pens of his competitors. His subjects were the ones usually preferred, and the chief characters were socially determined. Like his contemporaries, he took little care with his plots. His maidens, his villains, his fools, his princes, his courtiers, his rabble, his lovers, were of the well worn type then in demand. Again, the large number of the motives which guide the plays accord with the common stage practice. Even his over-grown vocabulary and his coarse scenes obeyed an evil custom.

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* See, for instance, Symonds, *Shakespeare's Predecessors*, 1900.

Attempts have been made, *e.g.*, by Brandes (*Shakespeare*, 1898), to explain the nature of Shakespeare's plays from a consideration of the development of his individuality.* To me the social factor seems the decisive circumstance. The poet dramatised English history because that was the fashion; every dramatist was doing it, and had to do it, it being a question of demand and supply. So with comedies: they were in request, and they had to be written; and so also with tragedies. In the same manner Shakespeare's characters or scenes were strictly of the kind current at the theatres. He was no innovator. He was a strict conservative. The number of plays Shakespeare wrote would never have surprised an Elizabethan groundling, for most writers wrote as much, if not more, within the given time. The marvel vanishes if we reject the individualistic view in favour of a social one. Let us but admit that most plays were merely refinements of other plays or dramatisations of well known stories: that the treatment generally, including philosophical views, was, as a whole, determined previously; that all characters, whether Italian, French, Roman, Greek, were regarded as Elizabethans; and we can easily allow that plays might be written in a short time. The supposed learning in Shakespeare must be explained by the same rules. Much of it was held in common, and a good deal of it is shown in many writers. If we make due allowance for what was social property, for what was expected of each dramatist, and reduce to their proper level the hasty generalisations as to Shakespeare's learning, we shall find little or nothing to excite our wonder. Shakespeare's large vocabulary is not extraordinary, if we think of the Elizabethan stage.

Shakespeare's powers of characterisation have been inordinately praised. He is supposed to have presented the various human types in perfection. As a matter of fact, few even among his riper plays contain really well drawn characters. In the earlier plays the unsuccessful striving to depict individuals true to life is evident; while many of the latest pictures are carelessly delineated. Only hero-worshippers go systematically into raptures over everything attributed to Shakespeare, magnifying every excellence, turning every fault into a virtue, and depreciating everything which he did not write. The scriptures of no race have ever been praised with greater ardour and less discrimination, and no worshipper has ever been more jealous of his god than is the pious Shakespearean. An impartial inquiry will minimise the differences between Shakespeare and his compeers, and lead to a more comprehensive admiration for the later Elizabethan stage.

There is no lack of rhodomontade in *Hamlet*. For example, the gentle Ophelia, speaking of man exclaims: "How noble in reason! how infinite in faculty! in apprehension like a god!" This is far from being a defensible summary, and would be ridiculed if Marston had written it. Yet the latest authority on Shakespeare (Lee, *Life of Shakespeare*, 1899, p. 357) boldly declares that "to Shakespeare the intellect of the world, speaking in diverse accents, applies with one accord his own words: 'How,' etc., etc." Baynes (article "Shakespeare," *Enc. Brit.*), Brandes (*Shakespeare*, 1898), Coleridge (*Notes on Shakspere*, 1883), Collins (*Essays and Studies*, 1895), De Quincey (*Shakspeare*, 1864), Delius (*Abhandlungen zu Shakespeare*, 1878 and 1888), Dowden (*Shakespeare*, 1875), Dyce (*The Works of William Shakespeare*, 1864-7), Elze (*William Shakespeare*, 1888), Fischer (*Richard III*, 1868, and *Hamlet*, 1896), Furnivall (*The Leopold Shakespeare*, 1877), Gervinus (*Shakespeare*, 1862), Guizot (*Shakespeare*, 1852), Hallam (*Literature of Europe*, 1854, iii, pp. 77-124), Halliwell-Phillips (*Outlines of the Life of Shakespeare*, 1887), Lamb (*The Dramatic Essays of Charles Lamb*, 1891), Massey (*Shakespeare's Sonnets*, 1872), Henry Morley (Introductions to Cassell's *Shakespeare*), Smith (*Shakespeare*.

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* Robertson (*Montaigne and Shakspere*, 1897) also ignores the Shakespearean environment, tracing Shakespeare's thought to Montaigne. So does Hudson (*Shakespeare*, 1872) who is otherwise judicious.

the Man, 1899), Taine (*English Literature*, 1886, ii, pp. 45-141), Ward (*Dramatic Literature*, 1899), Wyndham (*The Poems of Shakespeare*, 1898), and others, agree more or less closely with Lee's estimate, on equally indecisive grounds. In this respect it is well to note the general admiration lavished on Shakespeare's alleged power of suppressing his personality. Every character drawn by him is said to be photographed from nature. Strange to say, this does not strike every one. See what an extraordinary share word-play or quibble has in the comedies. Assuredly, there is no reason to believe that it entered as much into real life. Is it not rather our impersonal hero, masked, dealing thrusts and parrying them, because he could do it so well, having learned it from Lilly? Similarly with the broad humour: Lance, Jack Cade, the constable in *Measure for Measure*, the hostess in *Henry IV*, the clown in *The Winter's Tale*, in *Othello*, and in *Anthony and Cleopatra*, the gravediggers in *Hamlet*, and plebeian figures generally, appear all drawn to one familiar artificial pattern. The same holds good of the ladies and children in the various plays, as well as of the courtiers. Roughly speaking, the situations differ much, and the actors very little. Shakespeare delighted in drawing complex characters; but he only succeeded after struggling for many years. The Bastard is a failure, and so is Richard III. They are neither fish, flesh nor fowl. Prince Hal, too, is not what the dramatist would have made him a few years later. Through three plays—*Henry IV* (parts 1 and 2) and *Henry V*—Shakespeare vainly strives to make his hero intelligible, and has at last to resort to verbal explanations. Macbeth, King Lear, Anthony and Cleopatra, represent magnificent heights which their author only attained after the most desperate efforts and after many defeats. Slowly, very slowly, the artificer gained control over his material. Many a character had he to draw imperfectly, before his ideal and its embodiment were, roughly speaking, as like as the two Dromios. Yet modern criticism represents this great Elizabethan as if he turned out characters as machines turn out flawless coins in the mint! When will Shakespeare and his age have justice done to them? When will Shakespeare's biographers begin to study Shakespeare, instead of speculating about him? Up to the present, textual criticism has done its work excellently; but literary expositors have merely encumbered the road with theories.

It is remarkable that during his life time there was not one voice which singled him out above all others. He was considered as one of the first playwrights, and no more. He was neither over-praised nor over-blamed. He was never accused of being an innovator. He lived an obscure life like his fellows, and, like them, cared little for fame, doubtless because the people were satiated with first-class plays. Accordingly, we are not surprised to learn that Shakespeare's philosophy was to the minutest detail part of the stock reflections current among the dramatists. The thoughts were adopted, and not prepared, by him. He is not the original thinker he is represented to be. That honour belongs to his age. The peculiar class of reflections which we find scattered throughout his works are employed, with variations, by the majority of the contemporary playwrights. His originality was everybody's originality. We note one thing, however, that just as in the sonnets he is the poet who returns oftenest to the impersonal element, so his dramatic works disclose the same trend. From his earliest to his latest play, this holds good. He is reflective in season and out of season. Everybody mouths it. In dust-heaps, in mole-hills, and in rocks, we catch the golden gleam. Every kind of stratum apparently, soft or hard, recent or primeval, contains and displays gold. It is impossible not to welcome the precious metal, even though we may think that a dust-heap is not the proper place for it. Still, the critic's duty is to be above temptation, and while, therefore, greedily abstracting the treasures, we must question whether the dramas, as such, do not lose by the indiscriminate presence of fine language; whether it does not impart to them a certain artificiality and coldness; whether the Elizabethans were wrong, from the dramatic point of view, in differing from us; and whether the future will not take a middle course and sympathise to some extent with those who attended the earliest performances of Shakespeare's dramas. In this place, however, we are only concerned to note that, roughly speaking, the impersonal element is more uniformly predominant in Shakespeare than in his contemporaries, indicating not originality but greater emphasis. This divergence, as well as his abundant use of metaphor, is probably accounted for by his particular line of development under his special circumstances; but on the discussion of this point I cannot enter here.

We have indications that Shakespeare was highly thought-of by his contemporaries. (Halliwell-Phillips, *Outlines*, ii, pp. 147-55.) That he was almost from the first regarded as one of the principal playwrights is not disputed; but beyond that the Elizabethans did not go. When, for instance, Meres (*Palladis Tamia*, 1598) speaks of Shakespeare's "sugared sonnets," we must bear in mind both that the Elizabethans were fond of honeyed phrases (compare Meres' reference to Drayton as "golden-mouthed"), and that the adjective was in common use. So, also, when the same author places Shakespeare first in one of his numerous lists, we have but to glance at the other lists to see that Shakespeare frequently occupies very low positions, and that, in truth, something other than a standard of merit guided Meres in allotting seats at the literary banquet. So it is throughout. Any other interpretation is due to the notion that the Elizabethans *must* have taken the same view of Shakespeare that most moderns do.

Utterances of a reflective character were common among Elizabethan dramatists. It would go beyond reasonable limits to illustrate this assertion at length. I will give two quotations instead. Marston, who is the author of what follows, was twenty-seven years of age when *Antonio and Mellida* and *Antonio's Revenge* were published in 1602, the plays having been performed probably two years earlier, that is before Hamlet. I choose Marston's words principally on account of his youth, and because of the early date at which he wrote.*

"Why, man, I never was a prince till now.
'Tis not the bared pate, the bended knees,
Gilt tipstaves, Tyrrian purple, chairs of state,
Troops of pied butterflies that flutter still
In greatness' summer, that confirm a prince:
'Tis not the unsavoury breath of multitudes,
Shouting and clapping, with confused din,
That makes a prince. No, Lucio, he's a king,
A true right king, that dares do aught save wrong;
Fears nothing mortal but to be unjust;
Who is not blown up with the flattering puffs
Of spongy sycophants; who stands unmoved,
Despite the jostling of opinion;
Who can enjoy himself, maugre the throng
That strive to press his quiet out of him;
Who sits upon Jove's footstool, as I do,

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* Ward (*Dramatic Literature*, 1899, ii, p. 477) speaks of "the story of *Antonio and Mellida* (printed in 1602, but probably acted two years earlier)." Dekker's *Old Fortunatus*, published in 1600, is another early play full of fine passages.

Adoring, not affecting, majesty;
Whose brow is wreathèd with the silver crown
Of clear content: this, Lucio, is a king,
And of this empire, every man's possesst
That's worth his soul."

Antonio and Mellida, act 4, scene 1.

Ant. "Why then should I put on the very flesh
Of solid folly. No, this cockscomb is a crown
Which I affect, even with unbounded zeal.
Alb. 'Twill thwart your plot, disgrace your high resolve.
Ant. By wisdom's heart, there is no essence mortal,
That I can envy, but a plump-cheeked fool:
Oh, he hath a patent of immunities
Confirmed by custom, sealed by policy,
As large as spacious thought.
Alb. You cannot press among the courtiers,
And have access to—
Ant. What? Not a fool? Why, friend, a golden ass,
A baubled fool, are sole canonical,
Whilst pale-cheeked wisdom and lean-ribbed art
Are kept in distance at the halbert's point;
All held Apocrypha, not worth survey.
Why, by the genius of that Florentine,
Deep, deep-observing, sound-brained, Machiavel,
He is not wise that strives not to seem fool.
When will the duke hold fee'd intelligence,
Keep wary observation in large pay,
To dog a fool's act?
Mar. Ay, but feigning [when] known disgraceth much.
Ant. Pish! most things that morally adhere to souls,
Wholly exist in drunk opinion:
Whose reeling censure, if I value not,
It values naught.
Mar. You are transported with too slight a thought,
If you but meditate of what is past,
And what you plot to pass.
Ant. Even in that, note a fool's beatitude:
He is not capable of passion;
Wanting the power of distinction,
He bears an unturned sail with every wind:
Blow east, blow west, he steers his course alike.
I never saw a fool lean: the chub-faced fop
Shines sleek with full-crammed fat of happiness,
Whilst studious contemplation sucks the juice
From wizard's [wise men's] cheeks: who making curious search
For nature's secrets, the first innating cause
Laughs them to scorn, as man doth busy [punish] apes
When they will zany [mimic] men. Had heaven been kind,
Creating me an honest senseless dolt,
A good poor fool, I should want sense to feel
The stings of anguish shoot through every vein;
I should not know what 't were to lose a father;
I should be dead of sense, to view defame
Blur my bright love; I could not thus run mad,
As one confounded in a maze of mischief,

Staggered, stark, felled with bruising stroke of chance.
I should not shoot mine eyes into the earth,
Poring for mischief that might counterpoise
Mischief, murder, and—"

Antonio's Revenge, act 4, scene 1.

The Antonio plays of Marston are full of such moralisings. It is needless to say that Beaumont and Fletcher, Massinger, Ford and Webster, philosophise incessantly. For weight of language Webster's *Duchess of Malfi* seems unrivalled. I may add that all the great dramatists supplement Shakespeare as he supplements them.

The absence of the judicial spirit in dealing with the work of Shakespeare has made a somewhat controversial attitude necessary. The upshot of our examination is embraced in the statement that Shakespeare's dramas, like his sonnets, are so largely indebted to his environment that, by comparison, his own contribution, a very real thing, shrinks into utter insignificance, a ripple on a mountainous wave.

The extravagant praise of the great dramatist led directly to the theory that Bacon wrote the works attributed to Shakespeare. Incautious reasoning, however, could not stop there. So many other playwrights wrote in a "Shakespearean" vein, that the suggestion was made and accepted that Bacon wrote several hundred plays, and published them under different names. Consistency could hardly go farther. The same problem is disturbing the Shakespearean camp. Almost scores of plays have been attributed to Shakespeare, besides those for which he is ordinarily held responsible. I shall not be surprised to hear some ingenious theorist suggesting that Shakespeare had a hand in the hundreds of Elizabethan plays which have in them any value. It is strange to see shoals of critics who believe that Shakespeare was *unapproachable*, now maintaining and now disputing the Shakespearean origin of a play or a passage.

210.—Obstacles to Genius.

Assuming that our critical scalpel has laid bare the truth with regard to Shakespeare, are we, therefore, justified in asserting that every man of genius is an expression of his age rather than a striking individuality? That, at all events, is the conclusion which I have laboured to reach. The psychological reasons are not far to seek. They lie within the limits of what we have already learnt in the previous chapters. Each portion of our nature contributes to the result.

(1) *Inherent Limitations.*—The realm of possibilities is only rivalled in extent by the realm of impossibilities. "Might-be's" are constantly balanced by "is-nots." In the first place the natural relations of things are not self-evident: we often fail to suspect them, and generally our guesses fall short of the truth. It is only when we weigh a matter carefully, when we give to it prolonged attention, when we allow observation to apply to it the touchstone of sanity, that we can feel at all satisfied about the quality of a resulting thought. Unforeseen difficulties, in what is seemingly a successful deduction, occupy us and prevent us from being otherwise engaged. The poet is compelled to test his little improvements, spending years in perfecting them. The architect applies his small architectural contributions, his life being absorbed in carrying out his limited ideals. The prose writer has to learn what style is before he can become

a competent critic. So it is in every department of knowledge: with the little reach the human brain yet possesses, the energy of the individual is burnt up in securing a comfortable resting place. The oasis of learning is so small that, like children, we feel safe only in, or close to, our immediate environment. Not that bold explorers are wanting; for, indeed, if daring were always profitable, mankind would be revelling in the pearls of culture. As a matter of fact, it is the rule rather than the exception to fly to sensational methods for the purpose of wringing from nature her meaning, and forcing her pace. To leave, however, our environment far behind us, is to deprive ourselves of our native air, and to put ourselves at the mercy of wild beasts. Unsatisfactory as from an ideal standpoint the lessons learned by the race seem to be, they are yet a solid rock for us, and away from them we plunge into and are swallowed up by the ocean of possibilities. No sooner do we appear to alight on a great truth in our original investigations than we have our hopes almost instantly dashed. A developed system of education, itself the result of study, will, to a considerable extent, increase men's powers; but in the present state of chaos, fruitful thinkers find that the fattest pastures lie nearest to the outskirts of the known.

With our present organism genius of the mythical type, except as a breach of continuity, is impossible. It takes a man a long time to acquire the rudiments of knowledge. Years pass in polishing, in mastering, and perchance to some extent perfecting these rudiments on the lines suggested by observation. Happy is he, therefore, who chances to live in a period which stimulates reasonable activity, for he can then with advantage embody in his own attempts, as Shakespeare did, much of the work of his contemporaries. A man never creates a great environment; but an environment full of greatness has been the invariable antecedent of the men with whom we connect significant epochs.

Sully (*Genius and Precocity*, 1886) gives some statistics which bear on the question of precocity. Of 30 musicians, 18 reached eminence before the age of 25; of 42 painters, 28 before 25; of 49 poets, 28 before 25, 36 by 30, 45 before 40; of 35 scholars, 7 before 25, 9 before 30, 16 before 40; of 37 scientists, 14 before 25, 12 between 25 and 30, 8 between 30 and 40; and of 35 philosophers, 3 before 25, 4 between 25 and 30, 14 between 30 and 40, 6 between 40 and 50, and 8 after 50 (among these last are Descartes, Hobbes, Locke and Leibnitz). Sully holds that high development of special functions accounts for the divergences in precocity which the above list reveals. That is to say the musician has tone-sensibility early developed; the poet an eye for form and colour; the scientist, mathematical ability; the scholar, memory. Singularly enough *this congenital equipment is regarded by some authors as explaining the intelligence of animals, and is referred to as a proof of the absence of reason.*

A similar line to that taken by Sully is exemplified in Gerard, *An Essay on Genius*, 1774, a solid book of the associationist school. This eighteenth century author holds that "Genius is properly the faculty of invention" (p. 8); that imagination is at the basis of invention (p. 31); that such imagination implies comprehensiveness (p. 42), regularity (p. 46) and activity (p. 57). In its turn imagination depends on the suggestions of sense-impressions (p. 95), on those of memory (p. 96), and on the laws of association (pp. 108-25); also on the power of habit (pp. 125-47) and that of emotion (pp. 147-84). Gerard contends that judgment is secondary, though necessary to a certain degree in genius. On the basis of this analysis, he then argues that variety in genius is explained by the prevalence of certain exclusive characteristics in individual men, *viz.*, judgment must be highly developed in philosophers, and taste in artists.

Galton (*Hereditary Genius*, 1869) holds the following view on the subject. Men differ very considerably from one another in ability, and that apart from education. The birth of a certain number of men of genius is, therefore, as determined as the birth of a certain number of those who fall far below the average, namely imbeciles. Genius being inborn, it is natural to infer that it runs in families; and this Galton attempts to prove at length. Being inborn, he reasons further, genius will and does assert itself. Two answers have been given to Galton's theory of hereditary genius. Royse (*A Study of Genius*, 1891) contends that there are scarcely any examples of several men of genius, of independent reputation, in one family (pp. 157-86). Nordau (*Psycho-Physiologie du Génie et du Talent*, 1897) further reduces Galton's eminent men to ordinary men in fortunate circumstances. Galton's theory, therefore, as far as its claim to be important goes, meets with difficulties. To the question of innate differences we shall return.

Spencer (*Study of Sociology*, 1880) insists that a man of genius cannot be conceived of independently of his environment (pp. 30-6). This is a trite contention, since it does not differentiate the man of genius from the ordinary individual, for granting that he is "a product of its [society's] antecedents" (p. 34), there is still the possibility that he is immensely superior to his fellows.

Allen (*Nation-Making*, 1878; *Hellas and Civilisation*, 1878; *The Genesis of Genius*, 1881) gives body to Spencer's shadowy view. He considers three elements as the vital ones in the making of a nation, *viz.*, the stock from which a nation springs; the physical features of its habitat; and the time which has elapsed since its settlement (*Nation-Making*, pp. 590-1). From these three elements he deduces the differences in nations and races. For him great commercial centres are always genius centres. He says "Wherever we look, we see that intellect can only be produced by practical gains of brain-connection, made slowly generation after generation in the ordinary course of life, and finally culminating in a general average of high intelligence, varied by those exceptional deviations which we know as genius" (*Hellas and Civilisation*, p. 168). To this he adds: "Even a Darwin or a Spencer stands at a comparatively measurable distance from the average run of our naturalists and our philosophical thinkers" (*The Genesis of Genius*, p. 373). Indeed Allen holds that the bulk of progress is attributable to the efforts of the many, and that not a few are ready to enter the niche open for a great man (*The Genesis of Genius*, p. 374). Allen's fault, if we are to speak of faults, seems to be that his doctrine is too rigidly applied by him. He insists too much that "both genius and milieu are products of the geographical conditions" (*The Genesis of Genius*, p. 380), and that "individual characters themselves, in their totality, are wholly created by the external circumstances" (*The Genesis of Genius*, p. 372). He forgets that men are part and parcel of an environment, and that, therefore, there is action and reaction, though the one force may be more potent than the other.

Opposed to Allen, stands James (*The Will to Believe*, 1897). "The best wood-pile," he argues, "will not blaze till a torch is applied" (p. 242), the blazing torch being the man of genius and the passive wood-pile the community. History, he reasons, is solely made by great men. They see to it that plans are carried out. "The community stagnates without the impulse of the individual. The impulse dies away without the sympathy of the community" (p. 232). And whence do these men take their origin? Here is the answer. "The causes of production of great men lie in a sphere wholly inaccessible to the social philosopher. He must simply accept geniuses as data, just as Darwin accepts his spontaneous variations. . . . The visible environment . . . chiefly adopts or rejects, preserves or destroys, in short *selects* him" (pp. 225-6). And "physiological forces . . . are what make him" (pp. 234-5). As regards these emphatic opinions, it is scarcely necessary to state that they have a decidedly speculative basis. James makes no attempt to analyse a single case.

Joly (*Psychologie des Grands Hommes*, 1883) has written by far the best book on the subject under discussion. He rightly argues against Galton that inherited genius requires, as to its nature, as much explanation as any other conceivable kind of genius (p. 65). He holds that a man of genius is not merely a conspicuous figure in a community (p. 15); that he gives birth to a tradition which largely stifles the influence of others (p. 35); that he develops best when institutions are being founded or organised (pp. 37-8); that he "is evidently the culminating point of his race" (p. 53); that genius is creative and not destructive (p. 130); that he begins with being a genuine disciple (p. 141); that his apparent spontaneity is the result of accumulated reflection (p. 231); that his primary gift is to conceive something great (p. 260); and that in him must be embodied enthusiasm, perspicuity, breadth, imagination and power (p. 270). "At a given moment," Joly sums up, "the man of genius is for the life of his country and his epoch, that which the brain is to the complex organism, co-ordinating everything, disciplining the surbordinate forces, and directing all things towards a single end, while receiving nevertheless his nourishment from the infinitely minute labours and actions of the organism which he animates" (p. 274). From this it will be seen that Joly still fails to note that the man of genius lives in an atmosphere of genius, and is but its fairest sample; and, what is more, that *the genius theory is largely a convenient social convention, since it enables historians to summarise the work of a period in a simple way.*

Nordau (*Psycho-Physiologie du Génie et du Talent*, 1897) has the following theory on the subject. What is inherited is that which is commonplace, while that which bears promise indicates deviation from the type (p. 17). The essential qualities of a man of genius lie in the power of elaborating in his own fashion the apperceptions of the outer world (pp. 54-5). Genius is something inborn, while talent is produced by labour (p. 59). A powerful development of the centres of judgment and volition represents the physiological basis of what we call genius (p. 147). Hence there is no such thing as genius among painters, poets, etc., since these are dependent on emotional development (p. 157). Altogether there are four classes of genius, *viz.*, thinker and actor—statesman; thinker and experimenter—scientist; thinker—philosopher; and, by courtesy, artist-poet (pp. 160-5). Nordau makes no attempt to verify or test his theory.

(2) *Organised Reaction.*—We have seen how intrinsic are the difficulties which lie in the way of striking originality. One more obstacle may be added to those already discussed; it is furnished by organised reaction. It requires years to cut a path through the granite of a difficult subject, and when at last we have arrived at our journey's end, it is an exasperating task to obtain even a modicum of freedom. Suggestions having been along a certain line, ceaseless effort is needed to resist the dead weight of custom. New furrows have to be dug, old ones have to be filled up. The Herculean undertaking involved is too great to be performed by any one but a giant, and giants are creatures of the fancy. Only shallow persons readily turn from one subject to another; and the world can hope for little from them. It is probable that mastery profoundly impresses the brain structure, so that it is not easily impressed again to much purpose.*

(3) *Needs.*—If the argument from organised reaction is convincing, that drawn from the orderly succession of needs further strengthens it. We are not like candles which give a uniform flame from the time they are kindled to the time they are extinguished. The brilliancy, the colour, and

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* Even this, however, requires correction. In the great Italian period we find men eminent in a number of pursuits, men like Michael Angelo, Leonardo da Vinci, Galileo, and many others.

the size of the flame of our life, vary ceaselessly according to a certain plan. Accordingly, while we are children, or during adolescence, there exists no tendency to strike out original paths. So also when we are past maturity our power declines. There is, therefore, only a restricted portion of our life time available for original research, while we must consider, besides, that during the first third of life we fall into the humdrum ways of our fellows, and that organised reaction largely fixes us there.

211.—MEN OF GENIUS.

To all this it may be objected that granting Shakespeare's indebtedness, and admitting that normally men are necessarily unoriginal, it still remains a moot point whether what is called genius is not largely exempt from the instrumentalities which clip the wings of the common flock. This objection is valid theoretically, but not otherwise. As a may-be it cannot be rebutted; for what is there that may not be? As a question of fact, it is contradicted by the teachings of history.

I have shown in detail how dependent at least one man of acknowledged genius was on his environment. It would be humanly impossible and monstrously unprofitable to analyse the labours of all those inscribed on the roll of fame, and it must suffice, therefore, if we can generally trace the same apparent relation between the individual and his age as we have done in the case of Shakespeare.

The genius of Raphael is a commonplace everywhere, yet he stands in no way isolated. It would be an illustration of pure originality if, among a savage tribe whose individual members hitherto neither scribbled nor scrawled, one of them took to painting in the style of Leo the tenth's period. That man would be compelled to discover the canvas on which to paint, the colours and the brushes, the nature of perspective, and the whole mystery of art. Such a state of things involves no contradiction; it is only one which has never been observed. As we should expect, we find that the agreement between Raphael and the host of superb painters of the Renascence is almost infinitely greater than the difference. If only Raphael (died 1520) could be proved to have painted his pictures a century earlier, there would then be some hope of discovering a sudden and startling departure in style from his brethren in the craft. As it is, his work determines the time of its production, and his time determines its qualities. The distance between the drawings on mammoth tusks, or the pictorial attempts of low-class savages, and the golden era of art in Italy, can only be bridged by microscopic arches made of the life work of an imposing procession of successive workers, influenced in each case more particularly by their environment as far as it affected the products of the brush. Egyptian, Chinese, Japanese and Greek paintings vary in essentials, and in no instance is the difference the result of the efforts of single individuals. Manner and matter are historic products. The painter's Madonna tells a long story of improvements. No *one* man created her.

In architecture the ceremonial pace of progress is clearly traceable. Nobody would dream of attributing to the illustrious Sir Christopher Wren all the art exhibited in St. Paul's Cathedral. The mud-hut has a history; and the conception of a magnificent structure like that we are speaking of is almost entirely a result of evolutionary processes. The several styles employed by Wren have each a tale of their own to tell. Nor is the general plan of the building original. If root-and-branch originality were possible, it would be strange that the few architectural styles which we, and other races, possess, should have been evolved in so deliberate a manner. There is scarcely a minor style, such as the perpendicular, but has developed by slow degrees.

The above brief remarks on architecture find ample corroboration in the works of Ruskin. In that great art critic's *Seven Lamps of Architecture* the reader will see many illustrations of the very slow and almost accidental growth of architectural styles. So convinced is Ruskin that individual genius by itself is powerless that he ridicules the present-day architects who are too proud to be disciples, and contends that no great English architecture will arise until a school of architecture has been established of which the mass of English architects shall be followers. One beautiful passage well brings out the truth that not individual but social genius produced the art exhibited in the great cathedrals. "It needs but little inquiry into the spirit of the past, to ascertain what, once for all, I would desire here clearly and forcibly to assert, that wherever Christian church architecture has been good and lovely, it has been merely the perfect development of the common dwelling-house architecture of the period; that when the pointed arch was used in the street, it was used in the church; when the round arch was used in the street, it was used in the church: when the pinnacle was set over the garret window, it was set over the belfry tower; when the flat room was used for the drawing-room, it was used for the nave. There is no sacredness in round arches, nor in pointed; none in pinnacles, nor in buttresses; none in pillars, nor in traceries. Churches were larger than most other buildings, because they had to hold more people; they were more adorned than most other buildings, because they were safer from violence, and were the fitting subjects of devotional offering: but they were never built in any separate, mystical, and religious style; they were built in a manner that was common and familiar to everybody at the time. The flamboyant traceries that adorn the façade of Rouen Cathedral had once their fellows in every window of every house in the market-place; the sculptures that adorn the porches of St. Mark's had once their match on the walls of every palace on the Grand Canal" (*The Stones of Venice*, 1888, ii, pp. 153-4).

Machinery, and what more marvellous modern product is there, displays all those indications of development which we should expect to find. The locomotive was not invented by one man; the latest type of battleship has not been thought out by one individual; the rotatory printing machine boasts of a long history. Thus while the series of mechanical inventions is endless, each is a slight variation of some previously existing form. The machinery employed in the large industries is the result of favourable social conditions on the one hand, and the efforts of a large class of inventors on the other.*

The history of astronomy offers another appropriate illustration. Had Laplace written his *Traité de Mécanique Céleste* without consulting his forerunners, we should have a marvellous book before us. As it is, astronomers were court favourites thousands of years ago; they had every opportunity for original research; they were often enabled to spend their lives in studying the tidal star wave, and yet progress was deliberate and almost imperceptible. So with Newton. The way had been paved for the Newtonian theory by the unwearied researches of Ptolemy, Copernicus, Tycho Brahe, Galileo, Kepler, and thousands of humbler mortals, and but for these, the name of Newton would be unknown in connection with astronomical discovery. Without the succession of a file of thinkers, neither Laplace, nor any one else, could hope to discover a great truth. Newton is accordingly commonplace when he tries to pierce the secrets of astronomy beyond contemporary stellar achievements.

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* See Hobson, *Evolution of Modern Capitalism*, 1894.

Lectures, laboratories and text-books have familiarised the present century with the spirit of science. Yet that blessed influence is not the outcome of any one person's labours. There is not even an individual with whom the notion is connected, and it grew through centuries before it assumed definiteness. No one whispered to himself "I will be scientific," and lo! science was; but many toiled, now hoping and now despairing, until the darling of time was given birth to. And not even yet has this Ariel found his Prospero. Men are trained in scientific method by imitating others rather than by knowingly following its mandates. When once, however, the theory of science will be reduced to rules, we rightly expect that it will introduce the greatest revolution the world has ever witnessed. Learning will then be no longer the privilege of the few, nor shall we have to cling so desperately to the past.

One of the most significant results of modern research is the evolution which it has traced in religions. The tendency at one time was to make an individual responsible for the establishment of a religious system. As a band of lightning illumines for an instant the sullen darkness, so these legendary heroes were supposed to shed a momentary gleam into the surrounding spiritual night. Diligent criticism has dispelled this illusion, and has shown that a religious genius owes as much to the past as a poetic genius. The one is no more original than the other, for they are both representatives of their age. Accordingly, wrest from Confucius his rich environment, and as little is left as of Shakespeare under the same circumstances. He was only one of the luminaries which appeared before the dawn—for Taouism dates back to his time,—and his light was strong because it represented the ardour of China's past. Confucius was no self-centred recluse. Again, when Buddha preached his gospel of love and reason, he was but a mighty echo of India at her best. As with Shakespeare, so with Buddha, scarcely a notion can be proved to have originated with him. The great Nazarene also was not born out of his time. He was its child: the lineal descendant of the Hebrew prophets and of the environments which made these. He embodied the accumulated development of the morality of his nation, and his teaching can, therefore, be placed as readily as that of Shakespeare. His insight was the stored result of ages of zealous reformers. Unless he turned his back on his time, he was compelled to speak as he did. As the Elizabethan breathed poetry, so the age of the Nazarene breathed religion, and for both developments there was an environmental reason. Thus whether we turn to Socrates, to Zoroaster, to Laou-tze, or to minor heroes such as Luther and Knox, the telling element is still the social factor.*

In the light of this chapter the individual, by himself, is a puny, worm-like creature, and only becomes powerful and dignified when he represents the race owing to his having absorbed part of its accumulated intellectual treasures. It is for this reason that men thrown much on their own resources in any sphere, as, for instance, in matters of morality, become fanatical and narrow-minded. The good can no more be guessed at than can the wise or the beautiful. It is, therefore, a deeper want than mere superstition which makes men shudder when they contemplate being robbed of their sacred books. These books, being the outcome of much tribulation, contain a considerable amount of the wisdom of a race, besides being interpreted at any historic period according to some fixed and well understood method. Hence the individual believer, who feels his helplessness, naturally dreads being thrown back on himself; and he does well not to give too ready an ear to those who wish him to find the moral law within himself.

It follows from the foregoing that an ethical system should be a reflection of the profoundest generalisations based on observation, rather than a collection of maxims. The moral system which only in a general way inculcates virtue, duty and love, is bound to fail when it has to face the complex world of social and physical facts. On the other hand, a system of ethics like that of Confucius goes far to satisfy a right ideal. This Chinese thinker demands that men should be educated; that want shall be far from them; that the powers that be shall be just; that law shall have regard to reasonable social conditions and to circumstances; and that in *all* the relations of life obedience, for young and old, shall be conditioned by righteousness. Hence the vitality and the longevity of the Chinese nation. Scientific ethics will, therefore, seek to determine all those many conditions, psychological, physiological and environmental, which shall enable us to see the good and to embody it in our actions.

Whatever subject we investigate the same view is forced upon us. Man's progress depends on the ages, and men's genius rests on the explosive instability of their time. The history of the race is the grindstone on which the intellect is sharpened, and all that man can do, therefore, is steadily to enlarge and purify the realm of knowledge. *The intricacy of unattacked problems; the period required to put them to the test; the organic tendency to cling to cherished opinions; the short period of years during which we are capable of the work, all tend ruthlessly to restrict original productivity.* Entirely exceptional men are conceivable; but history presents us with no example. Our only hope, therefore, lies in the solidarity of man's endeavours, in the possibility of disentangling, for educational purposes, the chief factors of the reasoning process at its best. When this is achieved, man will have risen as much above his past as the primitive man rose above his ape ancestors.

The preceding analysis has, I hope, shown the environmental factor in genius. Our great man, so far as his greatness is concerned, is neither independent of his environment, as James and Galton suggest; nor is he a mere tool in the grip of his environment, as Allen appears to think. Both, environment and man, are real factors and actors. We should probably be right in holding that a Newton is somewhat the superior in sheer ability to any of his scientific contemporaries along his line of research; but that his success is due more to his times than to himself. I, therefore, disagree with Galton's and James' conception of the ability of the man of genius. Allen well says: "Except in a generally mechanical race, you will not find a Watt or an Edison; except in a generally literary race, you will not find a Shakespeare or a Goethe; except in a generally aesthetic race, you will not find a Leonardo or a Beethoven. We never see an inborn Raphael at Memphis discovering all the laws of perspective off-hand; we never see an original Channing or Howard springing at once into existence amongst the head-hunting Dyaks; we never see an incongruous Newton hitting suddenly upon the law of gravitation in some Zulu village" (*The Genesis of Genius*, p. 373). The primary reason for the condition pictured by Allen we have seen to lie in the greatness which has been *accumulating* in the great man's environment. This notion is well expressed in a passage of Joly's book. "The women of the seventeenth century, says Ste-Beuve, write with an infinite charm simply because they wish to do so: they all have the gift of expressing themselves well; and Mme. de Sévigné is only the first in a numerous assemblage" (*Psychologie des Grands Hommes*, 1883, p. 114). Again, men do not usually allow for the fact that sciences and arts have in most cases developed apart from men of genius; and that where great men played a part, as in Newton's or in Darwin's discovery, there the truths would generally have been arrived at without them, though not so soon. Royse (*A Study of Genius*, 1891) agrees to a certain extent with James. He instances the following men as influencing their environment as from the outside: Chaucer, Dante, Shakespeare, Goethe, Richter, Burns, Scott, Byron, Hugo, Dumas, Dickens and Hawthorne (*ibid*, p. 282). The truth of our theory with regard to these men is obvious. Royse is in error owing to his looking upon the environment as always meaning the populace. There is no need to accept so arbitrary a definition. To us the environment means any system of forces within the environment, as the dramatic world or the poetic world. Accordingly, if we take the names enumerated one by one, the social factor will in each case appear prominently. Chaucer, for instance, the first in the list, largely translated his tales from Boccaccio's *Decamerone*; Dante lived in an age of intense activity; Goethe had Schiller, Lessing, and a host of literary men about him; Scott and Byron were surrounded by Wordsworth, Keats, Shelley, and a galaxy of minor stars; and Dickens was one of a great hierarchy, constituted by Lytton, Scott, Thackeray, George Eliot, and himself. James attempts to account for this invariable grouping of great men by sudden showers of men of genius (*The Will to Believe*, 1897, p. 243); but the facts laugh to scorn such far-fetched explanations. Voltaire has around him Diderot, Rousseau, D'Alembert, and many others; Beethoven has an environment of genius; Raphael is in the same position; and so with great men everywhere. The man of genius is apparently always a dweller in a sphere of distinguished mortals. Were Galton and James right, such would not be the case; but there would be as constant a stream of men of genius as of imbeciles. The conclusion, then, is that men of special, though not of extraordinary, sensibility in some direction, tend to become pre-eminent when, and only when, the environment has duly prepared the ground. Sometimes these men are of little importance; sometimes they are of great importance; and sometimes they are absent when their presence would be a great boon.

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* So, generally, Lewes, *Problems of Life and Mind*, 1873-6.

The following facts may be noted in addition. If we take the case of Charles Darwin, for instance, we find that until the publication of his *Origin of Species*, he was merely considered one of many eminent men. When he had written the latter work, he was regarded as a man of genius. Yet if we leave out of view Darwin's principle of Natural Selection, that last work does not strike one as essentially different from any of his former ones. The difference, therefore, lay not in the workmanship, but in the conception. Yet this conception had grown for nearly a century, so that Darwin did little more than wed a brilliant conception with arduous research. His "greatness" was, therefore, chiefly due to the presence of a problem which he could solve. In its absence, Darwin would have been an eminent man of science, but not great. Every age has in this way many men who are potentially great; but who never become great because there is no opening for them. Imagine Darwin grappling with the problem before it had reached the acute stage, and he, too, would never have been spoken of as a man of genius.

There remains only the problem of the relation between Insanity and Genius. The question was first pressed in modern times by Moreau (*La Psychologie Morbide*, 1859) who boldly contended that the man of genius is a species of madman, saying: "Genius . . . has necessarily its material basis, and this basis is a semi-morbid condition of the brain" (p. 465). He based his argument on the supposed prevalence of neurotic characteristics among great men, arguing that "the pre-eminence of the intellectual faculties has for its organic condition a special diseased state of the nerve centre" (p. 481). Flourens (*De la Raison, du Génie, et de la Folie*, 1861) attacked Moreau, claiming that the essence of insanity is unreasonableness, whereas the essence of genius is pre-eminently distinguished by its reasonableness. Lamb, who died in 1837, had already written, "The greatest wits . . . will ever be found to be the sanest writers" (*The Essays of Elia*, ed. 1890, p. 220). Joly (*Psychologie des Grands Hommes*, 1883) showed most clearly that the presence or absence of marks of insanity had nothing to do with genius as such. Napoleon, for instance had a terrible temper, but his greatness lay not in his temper but in his generalship (pp. 83-4). The same thing is true of the hallucinations, epileptic seizures and fits of insanity, attributed to great men. Radestock (*Genie und Wahnsinn*, 1884) traces back the various eccentricities to a highly-strung nervous temperament; and reasons that much of the excess might be prevented if the man of genius carefully regulated his habits. Sully (*Genius and Insanity*, 1885), a year later, expresses himself thus: "No elaborate calculations are needed, I think, to show that mental malady occurs too often in the history of genius" (p. 959). At the same time he argues that great mental tension, fine sensibility and bitter disappointments, are the chief explanation of the vagaries of men of genius. In 1891 two books appeared on the subject in English. Lombroso (*The Man of Genius*) bluntly tells us that "genius is a neurosis" (p. vii). Ignoring what Flourens and Joly had said, he sets about finding traces of extravagance in great men, and naturally finds them. He does not take any one life as a whole for the purpose of carefully balancing the reasonableness or unreasonableness in the man. A single hallucination, a single fit of temper, is sufficient for him. He does not reflect that such a standard of insanity applied to the bulk of men, under anything like trying circumstances, would prove that all mankind is raving mad. Lombroso's volume is only a store-house of tittle-tattle. Indeed, every anxious business man, student, artist, be he ever so humble, shows precisely the characteristics which Lombroso wishes to make the mark of genius. The second book I would refer to is that of Nisbet, *The Insanity of Genius*. He says: "Apparently at the opposite poles of the human intellect, genius and insanity are, in reality, but different phases of a morbid susceptibility of, or a want of balance in, the cerebro-spinal system" (p. xv); and "What runs in the blood is nerve-disorder, of which genius is the occasional outcome" (p. 325). To prove his thesis Nisbet seems almost to hint that the very fact of a man of genius dying is a proof of his insanity. At all events, the presence of one out of a multitude of diseases in some one related to the man of genius, appears to this author to bear out his contention. Let him apply this test to any section of men, and there is little doubt as to the result. Besides, as has been repeatedly said, it is Carlyle's or Socrates' strenuous sanity which make them dear to us, and hence the explanation of their temperaments or their visions leaves the question of genius an open one. Nordau (*Entartung*, 1892), stimulated by Lombroso, makes a new application of his master's principles. To our author, Whitman, Rossetti, Swinburne, Ruskin, Nietzsche, Ibsen, Zola, and every one else of note, is a neurotic of a very objectionable type. In fact, any deviation from the common in a writer or artist, seems sufficient to brand that man as a victim of mental degeneration. Hirsch (*Genie und Entartung*, 1894), a medical man, criticises Lombroso and Nordau. His line of argument may be summed up in a sentence of his: "Genius resembles insanity, as gold might be said to resemble brass" (p. 126). In accordance with this view, he denies that most of the extravagant traits enumerated in men of genius are marks of insanity. When, however, Hirsch analyses the concept genius itself, he is unsatisfactory in his reasoning, contending that the word Genius has no definite psychological meaning (p. 75). Other publications on the subject are Baldwin, *The Story of the Mind*, 1902, ch. 10; Hagen, *Ueber die Verwandtschaft des Genies mit dem Irresein*, 1877; Meyer, *Genie und Talent*, 1878; Rosenkranz, *Psychologie*, pp. 49-55; Sanborn, *The Vanity and Insanity of Genius*, 1886; and Walshe, *The Nature of Genius*, 1886.

212.—INDIVIDUAL CHARACTER.

I have traced in Shakespeare what distinguishes him from the moderns, and what produces his resemblance to his contemporaries. I would now attempt the solution of another aspect of the problem dealt with in this chapter. Granting the likeness between Daniel and Shakespeare, we nevertheless do not confound the two men. There is something which impels us to distinguish between the poets, and this something I propose to analyse.

Examining the Sonnets we find that apart from their subject they bear a general resemblance. The similes are of a recurrent type. The vigour which we encounter in a few poems, we come across again and again. The tendency to deep-brained reflection of a certain order constantly asserts itself. The references are like in character. Were every few sonnets to suggest different philosophies of life, different treatment, different technique, we should suspect that more than one hand took part in their composition. We expect, and we find, uniformity. By Shakespeare everybody understands an individual with certain definite characteristics. There is a note, a tone, a breath, in what he writes, which betrays the one source. A good Shakespearean scholar tells, by reading a sentence or two, whether a passage is Shakespeare's or not.*

Evidently there is some uniformity underlying the typical characteristics of the individual. Looking at the question apart from the lessons of life, we wonder at this rigorously restricted range of a man's character. If ten men have ten different characters, why should not one man have ten characters? Why should not a man change his character repeatedly, or why should he possess a character at all? One is at a loss how to answer these questions from a "spiritualistic" point of view. Fortunately, our appeal to facts encounters no difficulties.

In the chapter on Re-development we saw that the powers of re-development were limited. Were we able to re-member with ease and completeness all that has happened to us, we should have a stock of knowledge to draw upon such as is now beyond human reach. As it is, the memory is perishable, and the record of events, in so far as it is not concerned with living interests, is reduced for lack of being referred to, whence results almost total oblivion as to childhood and ordinary affairs. If our interests were unlimited in range and depth, then, ignoring the overcrowding of thoughts, our memory might be nearly perfect. However, many interests, probably because of the inadequacy of brain-tissue, cannot co-exist, and when these press hard on each other's domain, there ensues a death struggle among the units of thought and action, which puts an end to overcrowding. Hence our interests are few, and, therefore, activity and memory are restricted.

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* This is not so easy since the Shakespearean text is frequently corrupt.

Organised reaction also plays no small part, for both the acquisition and the manipulation of notions are strictly limited functions. The plasticity of early childhood (to about the age of six) is remarkable, and as much can be done during that period towards laying a solid foundation as towards making a good one impossible. The time is past when reason or enthusiasm alone can be supposed to decide what we are capable of doing, and it is admitted on all hands that it is fatal to leave education to these two stimuli. The light of reason soon begins to flicker and pale; and the heat of enthusiasm is soon spent, when they have trends against them. Shortsighted interests are like vertigo; they make our thoughts spin in a small circle from which they never escape. For this reason, tendencies the existence of which we do not suspect, and the origin and tenour of which are unknown to us, determine our intellectual life to a critical extent. Were we born thinkers or were those who had charge of us thinkers, the evil might be considerably mitigated. As matters stand, our character is largely a question of accident. The manner of our reasoning, our temperament, our active impulses, are rooted by the time we begin to think over the propriety of things. With age preventing vital changes, and every stage of human life having its separate instincts, it becomes impossible to do much in later life. Thus opinions, the inspirers of thought, without our being aware of it, obtain an ever greater hold on us, till they control our veriest existence. So often do we refer to them that our whole thinking becomes coloured by them. These ever-present forces are responsible for our character. This uniformity is apparently no accident of history, and we have to choose between it and a shallow, unstable character. The nature of the brain, or our method of education, allows no other alternative.

This must not be construed to mean that character is something purely individual. Only one aspect of it is so. The outfit is copied from the environment, and then the special circumstances--the position of a notion among other notions, the individual's place among his fellows, and the physical structure he starts with—determine and, in so doing, slightly modify, what is learnt. In this way are produced the marks which sunder man from man.

Our "soul" does not invent or discover, and then cling to truths from choice; but life supplies us both with material and with the power of shaping or mis-shaping it. Apart from growing observation and the nervous system as we know it, character is meaningless. Our judgment, our reason, our imagination, our fertility of resource, our power of thought, are moulded according to the general facts which have been expounded in the previous chapters. The sparkling wit, the poetic nature, the philosophical mind, the lover of his race, would not be what they are, were it not for the peculiar workings of the brain. Wit, fancy, aphorism and moral insight cannot be considered as home-bred. They are the final result of a specially adaptive organism. We might as well expect an unadulterated specimen of the Bushman type to be at home in a West End drawing room as to hope for anything that is not the result of organised reaction. Our characters are not created, but evolved. The uniformity in human nature is not the consequence of choice, but of organisation.

From the impossibility of men being to any extent inventive, it follows directly that they must be a mirror of their times. Their restricted ability prevents their being so to speak more than moulds, casts or shadows of something larger than themselves. The net spread by the community hauls in everybody without exception, and it is for this reason pre-eminently that men are social beings. So, too, the civilised man, or the man of culture, is an absurdity apart from a civilised and cultured social state. Men take their cue from their environment. Hence not only in large matters, such as philosophy or art, but in the pettiest details our being is derived from a higher source. Even the manner of our thought, as we saw, results from contact with our fellows who embody a hoary tradition, and there is in us, therefore, infinitely more of others than of ourselves. Accordingly, the difference between myself and the fowls which walk about in the field before me, is that I am naturally a much better pupil, and if I had no more native taste for learning than they have, there would be little difference intellectually between us. Being dead to the past I should be dead to all that the words Civilisation and Culture imply. The difference, again, between one able man and another lies in the peculiar development of some sense or power, the painter's for colour, the musician's for sound, and the thinker's for strenuous thought.*

Absence of originality bounds us on every side. Our interests, as well as our facts, come to us, and are ours, only in the second resort. What we feel most, what stamps us most in a calm and quiet hour, what represents our views on birth, life and death, is borrowed. The isolated human creature never evolves rational conceptions. All he can do is to slightly improve or mar what is put before him. He may favour this problem or that; but it must be a socially produced problem. Nay more, it must be a live problem. Constantly hearing of the issues which stir the times; having them dinned into our ears; learning them at our mother's knee and from our teachers; finding them incessantly referred to in literature and in our intercourse with others, we become tacitly attuned to them. The present, by the structure of the brain (sec. 108), appeals to us most forcibly. It forms the normal food of thought. The problems which rouse a generation, and, in a lesser degree, a section of it, are by the nature of the case ever with us. Our daily thoughts, therefore, run in that direction. The growing capacity for thinking and enthusiasm ever encounters one set of notions; we are whirled along by them; and, according to minor determinants, we end by taking sides more or less with one existing party or another. The interests and feelings of individual men are, therefore, as much due to infection, to magnetic transference, to a sympathetic thrill, as the store of their knowledge is due to communication. From every direction the social impetus, like a glacier, carries us quietly but irresistibly along. It is, therefore, only the action of the mass of men that can appreciably influence the social pressure, and in this way we obtain the changing characteristics of a race. Hence the spell of the past is despotic. Not that men are patient under that rule, for they constantly tend to throw it off, fighting desperately against being dependants. This revolt forms the second great moulding force of developing humanity. We do not readily allow ourselves to be buffeted about by the chances of fortune. We resist, and though the resistance can avail us *little, yet that little determines the rate and the direction of progress.*

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* Sully, *Genius and Precocity*, 1886.

The hero worship of the old type is indefensible. We praise Shakespeare, and ignore, and almost contemn, his fellows. The array of poets who in the sweat of their brows fashioned the tools which Shakespeare used; the virtues of style discovered one by one by the meditations of the many; the power and passion with which his age supplied him, are forgotten. Yet take these out of Shakespeare's mind and heart, and where stand his magnificent works? Rational worship should be period worship, an admiration for the spirit which braced the times. The Elizabethan age, and Shakespeare only secondarily, should receive our gratitude. At most, a genius should be admired as a partial embodiment of a great era.

Recognition depends on character; that depends on uniformity in human nature; and that again on the psychological principles referred to in previous chapters. We saw in the last section how faithfully great men mirrored their world. We will note here how perfectly they hold up the glass to themselves. Shakespeare spoke in his works with no uncertain tone, and so does every one, great or little. This is strikingly illustrated in many ways. A lover of paintings who sympathetically visits the great galleries of Europe, will bear testimony to this contention. Entering for the first time a suite of rooms, in some famous gallery, he knows almost at a glance who were the painters of the various pictures. Within a few seconds he traces to their source a dozen works of art. Correggio, Tintoretto, Leonardo da Vinci, Raphael, Dürer, Sir Joshua Reynolds, Fra Lippo Lippi, one and all are recognised without hesitation. To the practised eye deception is almost impossible, except where there has been deliberate imitation. Who could look at a Velasquez, and not tell it from a Murillo; or a Rubens, and not distinguish it from a Rembrandt; or a Correggio, and not differentiate it from a Raphael? For reasons I have already insisted upon at great length, no one can be a Velasquez, a Murillo, a Rubens, a Rembrandt, a Correggio, and a Raphael, all in one. The facts, as we see, unhesitatingly confirm our statement.

As with painting so with poetry. A few lines recited to a connoisseur at once betray the author. Longfellow, Whittier, Lowell, Tennyson, Browning, Swinburne, William Morris, Shelley, Keats, Wordsworth have they not each a certain something, a spiritual signature attached to their words, by which they are almost instantly recognised? Their individual vocabulary, their sentences, their similes, their fancies come from the same foundry. Viewing an exhibition of Watts' collected pictures, we observe a striking similarity between them. A few hundred yards off, and on the same day, we see Lord Leighton's pictures. How like these are to each other; how different from those of Watts. Thus, looking through any two poets, we cannot help noticing the surprising unity there is in each of them, while they differ equally from each other. *The individual's range is almost petty; the products of his time are almost indistinguishable; only the canvas of history is impressive.*

It scarcely needs to be stated that what is true of painting and poetry is true of all subjects and all men. The psychological machinery explains the fixed and narrow boundaries of the individual. Character—individual, national, racial, human, animal—is a necessary product. Dissociated from its psychological connections, its fixedness and limitation lose all meaning.

213.—RELATION TO NEEDS.

The Sonnets are an imperfect representation of Shakespeare's life. They delineate him at but one stage of his normal existence, and even here the tale is of necessity incomplete. His topic was more circumscribed than his nature, and we must, therefore, guard against too hasty generalisation.

We know that needs are the motor power of our existence; that as far as these vary in quantity and quality, so our characters vary with them. We are not aware of any abstract reason for the existence or the nature of human needs; we have to accept them as evolutionary products. It is well, therefore, duly to appreciate the importance of a true conception of their changes, for on account of this property of needs, character, in the larger sense, is not fixed. The study of the pictures of Sir Edward Burne-Jones or the collected poems of Tennyson is misleading in this respect. There is in them a comparative uniformity which is not characteristic of the painter and the poet, except in their professional capacity.

The characters of the babe, the child, the youth, the young man, the matured man, the middle-aged man, the old man, the dotard, are not determined in the first instance by social institutions or individual predilections. It is no accident that puppies, kittens, kids, lambs and the host of other mammals spend the first portion of their existence largely in play. It is their inherited nature to do so. In this way the needs of individuals vary with their age. The character of the new-born Shakespeare differs immensely from the matured man with a history: the former is interested only in sleeping and feeding, the latter's interests are too many to be enumerated. The fixedness is still an attribute; but the needs being different, the character is different also. It would be tedious to follow the development of the child into the man, and the man into the dotard. All we have to recognise is that as our needs vary with our age, so also does our character, and that such development is natural. It is the *naïveté* of human nature which makes child and man forget that their point of view is often one which only covers their age. It is amusing to hear a damsel of seven gravely pronouncing judgment; and it is sad to observe in one who has reached maturity a want of appreciation of the limitations of childhood. 'We nearly always live in the present, and view things in general from that standpoint. In the ardour of youth we swear eternal love and complete devotion, for the present is too all-pervading for us to appreciate the changed needs which must ensue. We live not only as if we were going to live for ever, but as if human nature were not subject to change; when, as a matter of fact, it is ever changing, though in accordance with a determined order.

Looking more closely into the question, we may be said to possess, as has been shown in ch. 7, a multiplicity of characters. (1) There is to begin with the *perennial character* which lasts through life. The child eats, so does the man, and so does the dotard. A number of processes accordingly remain faithful to us throughout life. Young or old, we are liable to heat and cold, hunger and thirst, comfort and discomfort. These and many more wants ever wait on us.

(2) As we pass through life, numerous fresh needs develop, reign for a time, and then vanish, giving place to others. Their appearance and disappearance are universal phenomena, and should not be attributed to social influences. Shakespeare's sonnet form was a social product; but not his love for the "dark lady." The essence of the latter is older than man himself. With the *periodic needs* which come upon us, we now like to hear fairy tales and to play games; now we desire sport and tales of adventure; now love is the exclusive theme; now we are full of great plans; and now we long for rest and reflection.

(3) The above classes express what is universal in us, what makes us resemble our kind. Then follows the personal equation. No two things are alike in nature, and certainly human beings are not born as copies of each other. To that must be added that the conditions under which we develop always vary, and sometimes considerably, from which fact arises the difference between species, races, ages, classes, families and individuals. Each has its character, and because the conditions surrounding them vary, they vary with them, due allowance being made for heredity. The individual or *personal character* is that which differentiates a man from his fellows. What must be emphasised is that the most fundamental portion of individual character is determined early in life. If our intellect and morals are neglected in the first seven years, it is likely that we shall be lost to all high endeavour, unless very special circumstances modify the result. If we have remained uncultured—wavering in thought, while intolerant of ideals—until we are in the twenties, we shall be singular exceptions if we ever show any mental virility. Normally the first twenty years, often the first six years, straighten us or deform us. The exceptions to the rule are so inconsiderable that they are not worth taking account of in a general estimate. Thus the first fourth of a life of four-score years, perhaps the first eighth, is by far the most decisive as regards the significance of our efforts. We cannot leave to the matured

reason to select the best path we are to travel on; that path is already settled. There is then no room for anything but barren repentance, and gigantic labour ending in dwarfish achievement.

(4) To the list we will add, for the sake of completeness, omitting here peculiar and political needs (ch. 7), what we call our *passing character*. Frequently individuals show ephemeral traits. They are interested now in this thing, now in that. They are for a period bad-tempered, good-natured or retiring. Those traits which float like foam on the surface of a man's being should be put in this category. These characteristics are not important.

214.—The Evolution of the Individual.

I have thus far dealt almost exclusively with what is more or less striking in the Sonnets, and I have neglected to inquire into the method of assimilating notions and applying them. I must now deal with that last point. A study of early childhood convinces us that men do not gather notions as they do nuts; for the notions are never separated, but organised and interdependent. They do not shoot up; they struggle into being. We cannot, therefore, embrace a truth as we might a child; or recognise it as we might our face in a brook. Truth has to take root in us, and only with the passage of years does it become part of us. That is as we should expect it to be, if we assume an organised psychological basis. Yet so simple are the facts of life that to illustrate the generation of notions, there is continual danger of having recourse to the familiar conceit of Minerva issuing fully armed from the head of Jove. On a transcendental presupposition that might be so: and the obscurity of psychic origins has undoubtedly given rise to a catastrophic conception which it nourishes.

The new-born babe, omitting potentialities, is much unlike fully armed Minerva. He possesses hardly anything except the sense of temperature and that of hunger. Nearly his whole life lies in these. Most of the time he lacks even that scanty outfit, being lapt in the arms of sleep.

With sight, smell, hearing and taste he is unacquainted. Not even a smile can be won from his lips. Slowly he begins to stare, as a preliminary to vision. It is some time before he recognises his nurse, and much longer before he welcomes other members of the household. Many months pass before there is more than a casual interest in the visual surroundings. The sense of hearing develops even more tardily, and accordingly for a long time he ignores sounds. Then he cries when the noise is deafening; then he hears without localising; then, at last, after many adventures, he turns to the point from which the acoustic waves proceed. The less important sense of smell develops much later. The child either disregards the scent of a rose, or merely pretends to an interest in smells.

For months, also, the child is unable to localise pain. Nothing in his behaviour tells the puzzled mother whether he is cold, or has inward pains, or is choleric, or is being irritated by a pin. All he does is to cry when some mishap befalls him. Such obstinate taciturnity tries the patience, and puts to the proof the intelligence of his custodians. In relation to this we observe the noteworthy fact that his sensations are not connected with the place of their origin. He simply feels. He plays with his feet as if they were foreign to him. He has no sense of organic unity, still less a conception of it (sec. 19). The child's reflection in the mirror is hailed as a baby companion.

With a softened stare, a sensibility to sound, a reference of pain to its source, a recognition of his body, comes the attempt at orderly movement and intelligible speech. However strange it appears, the writing of sonnets presupposes an uninteresting history of this nature, and one might say that it is as reasonable to expect horses to deliver sermons as to suppose that babes can write sonnets. Yet the story of the origin of Shakespeare's poems begins with his birth. Consistently ignore these exploits of childhood and those that preceded manhood, and the sonnets might as well have been written by a statue as by a human being. The child was father to the man and to the sonnets. Without his early accumulations the man Shakespeare would have been an idiot, possessing no powers of observation, discrimination, motion or speech, for these are the outcome of a complex nervous structure, built up by long training. Subtract what the child contributed to the sonnets, and they vanish out of sight; that is to say, all we do issues from our summed-up past. The organism which produces sonnets brings its whole life history to bear on the task.*

The man is rapidly being constructed. The child has an absorbing interest in motion. He moves about incessantly like a jackal in confinement. We almost hear his heart beating, and we see the consuming excitement in the face, as he makes a bold dash from chair to chair. Many are his falls, but still he perseveres, and uses no little ingenuity in his attempts to move about. After a year or two he can walk a little; but movement as a whole is yet in its first stages. The motions are still awkward and imperfect. Not till he has reached the twelfth year, and more, can he use his limbs with precision.

While still very young, about twelve months old, he begins to reason. Seeing the hand under the table, he identifies the owner; hearing a noise, he traces the source; he plays at bo-peep; and he snatches up quickly what he is afraid may be refused him. The vein of imitation is also very strong. Eager to act and reason, he freely repeats *what interests him.* Thus also he asks you to admire his dress, by pointing to it; or he pretends to smell the flowers.

Still, it is in connection with language that we find the richest growth of notions. Language is the golden key which opens to us the golden gates of knowledge. It is the sponge by means of which we absorb the thoughts of our fellows and the treasures of the past. With its help we come to make our own what it has taken generations of men thousands of years to accumulate.

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* The peculiar inattentiveness of infants and their lack of knowledge are to be explained, as in sec. 19, by the fact that all sensations are yet isolated.

Shakespeare's flowing sentences are not the outcome of the soul's spontaneity. They did not gush up from a mysterious well. Inspired as he felt sometimes, readily as the lines burst forth now and then, the inspiration and the readiness had nevertheless a protracted history. Their beginnings lay in the prophetic babbling of the infant, for as the violinist tunes his instrument, so the young child tries his vocal organs. For hours he enjoys to hear and feel himself gurgling, chirping and lisping—it is an earnest of what is to be accomplished a year or two afterwards. Where intelligent language commences, it is the tiniest possible rill, and the mighty river of conversation scarcely seems derivable from such a puny fountainhead. The splashing and sparkling, the thunder and lightning, the music and wit, of the final product are as yet unsuspected. Slowly and painfully he learns and is taught homely words. Mamma, dadda, bupper, b(r)ead, byby, tata, salt, milk, upstairs, chair, nice, naughty, gi(ve) me, etc., are the peculiar sounds he sometimes favours. Perhaps at the end of the third year his vocabulary reaches to a few hundred words, though great variations exist in this respect among children.* These words can only be called words proper by courtesy. In the large majority of instances they represent the barest skeleton as compared to the massive body of notions which they convey to adults. Even such a word as "mother" signifies to the learner not a hundredth portion which it does to us. While the child admittedly uses a word, he cannot as yet be said to grasp it fully. Only after many years does he acquire a just conception of all that it implies. The child's vocabulary is, therefore, no reliable gauge of its acquirements. It will be long before his conception of the words resembles ours in fulness and precision. Adults absorb average thoughts easily, not because of occult powers but because the paltriest fraction only of the new thoughts falls outside their past. In so far as words are comparatively new, such as those which express philosophical conceptions, it takes us several years to understand them honestly. The readiness with which we enter into matters is solely owing to the stock we have stored. We easily react, because we react organically, and because our past has prepared us for nearly every emergency. The reason which comes with maturity is no *deus ex machinâ*, as writers like Lotze would have it; but is the result of protracted wrestling with the world, the beneficial results of which wrestling are observable in the adapted nervous mechanism. Other factors enter into the equation; but the one just mentioned is the decisive one. Thought is organised. Its capacity is a product of evolution. Reaction is far-reaching, swift and sure, because, through growth, from birth onwards, the brain, and its coadjutors, have become perfected.

As the child grows, and learns through exercise, so the few hundred words change to perhaps 3000 or more. However, parts of speech, mixed haphazard, do not form a language, not at least the language of adult life. As, therefore, his vocabulary increases, the child constructs, mostly by imitation, at first, broken sentences. "Gi(ve) me bupper, p(l)ease," "I want this," "I want to go byby," "I like that," and similar word complexes are employed. At first the imitated sentences are short, crisp, incomplete and represent a speech. By degrees they become less and less imitations, and, at last, become longer and longer till they are similar to those of adults. Thus the language which it has taken untold centuries to form, is acquired through long practice by every human being. The phrase which we utter so glibly is the result of the functioning of an adapted organ. The words we use, the sentences we construct, the notions which underlie them, have each an unmistakable history. At the age of about ten, the child's speeches fairly well express his notions; but this stage of his development implies only a limited outlook. The wide, wide world is still a closed book to him. He listens to the conversations of his elders with wondering attention. Love, adventure, the family, business, politics, religion, hardly exist in his restricted purview. However, as he grows older, his vocabulary expands, the range of his conceptions widens and deepens, and the power of expression becomes sustained and virile. Then, may-be, he writes sonnets; but only when his past has provided him with skill, and supplied him with material, is such a task feasible. Even then he must have a quick ear for the subtle music of the metre. He reads till he becomes saturated with the spirit of poetry; he practises till he finds his wings ready for flight: nor does improvement end here. For years after his first successful attempts, his style ripens, showing a nearer approach to perfection.

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* See on this point Preyer, *Die Seele des Kindes*, 1884, pp. 439-42.

There is a long distance to traverse from the crying infant to the writing of King Lear. The span cannot be jumped. The poet has to creep steadily upwards till he reaches the highest summits. From notions which are concrete and insignificant, he marches to world-embracing abstractions. From mediocrity he advances to unsurpassed skill. The thoughts ever broaden and deepen, and his power of manipulating them keeps step. On innumerable occasions improvements in his manner of thinking suggest themselves, and these he practises until the fluid fashion of thought crystallises into a trend.

We have pursued the history of the child's acquisition of language and thought; but it is not our business to follow his development into every nook and corner. We know how painfully slow is the progress in reading, writing, arithmetic, or other school subjects. Years pass before we read and write with any proficiency. Many a boy and girl who leave school early, and imperfectly equipped, read badly for the remainder of their lives, though they may be diligent readers. A twelve months' neglect revenges itself sometimes for the rest of a normal life. In every direction, we, therefore, observe how established aptitudes determine the nature of the mature man.

It has often been lamented that we have no sure means of rightly interpreting the child mind. The fact, however, has been overlooked that adults are children in very many respects, and that in this we have a valuable clue to the understanding of the passage from childhood to manhood.

215.—THE ACQUISITION OF LANGUAGE.

In the preceding sections I have roughly sketched the general development of the individual. I must now examine in detail the method of thought as embodied in language. If organised reaction alone enables us to think and to speak freely and effectively, then it should be possible to discover how the web of speech is woven, and, accordingly, intelligent remarks, as they have a physiological aspect, and are due to development, should readily disclose their origin to the critical investigator. We ought to be able to show that the sentences betray in their composition the over-ruling presence of established trends. Every intelligible set of words must be hall-marked, if our point of view be correct. A sentence which cannot be accounted for organically, is inexplicable on our assumption. We can only deal with traceable complexes of a known order.

An average person speaks at the rate of about 160 words per minute when he is engaged in conversation, and, unless he is addressing an audience, scarcely any one is so slow of speech as to utter as few as 120 words during that time. On the other hand, 300 words per minute is no impossible speed. It would be interesting to know what is the exact number of words which an average person employs during an average day. Undoubtedly, as I had occasion to show in sec. 120b, thought is not infrequent in the absence of language; but we have as yet no experimental estimate to rely upon. We will assume, therefore—*it is only an assumption*—that the number of words used per minute is on the average sixty. This would give 3600 words an hour. Neglecting what speech there is in the dream state, we assume the waking hours to be fifteen. The words which are spoken, heard, read or thought-of during the day would hence be 3600 times 15, or fifty-four thousand, or, in round numbers, fifty thousand. We will further assume that the vocabulary extends to three thousand six hundred words. If so, many of the more common words, as "and" or "of" must have been used more than fifty times during a day. Some of the remainder perhaps have occurred but once or twice. Considering the average number of words employed in the routine of life, we may almost suggest that a large proportion of them is used every day. [*All these details are open to close observation, and* MUST *be determined experimentally.*] Thus very many words have been, perhaps, repeated by us every day for years, so that the major portion of a man's vocabulary has been re-developed thousands of times during a life time. His familiarity with it is unquestionable, especially if we consider how short is the time that passes between the use of the same terms (sec. 114).

Words seldom occur by themselves. Assuming about ten of them to a sentence, we utter, read, hear or think about five thousand sentences every twenty-four hours. The construction of these we must discuss somewhat at length, for there is no definite list of sentences in any language, and their number has no limit. To enter into their nature, therefore, we must forsake the strictly statistical method, however interesting it might be to know the frequency of repetition. Of course a child often says "I want a piece of cake, please," and we frequently say, "How do you do?" yet the quantity of complete sentences we repeatedly use is small compared to those employed occasionally. The repetition, we shall see, lies in the structural arrangement of the sentences, rather than in the sentences themselves. The method is that of cross-classification; that is to say, we vary the words in some well known way to suit special circumstances.

Given that the extent of variation is limited, so as to allow of constant reiteration, it becomes obvious that organised reaction will make us masters in the use of them. All that is required is that the multiplicity of forms shall be such as to allow of being assimilated organically.

This is precisely what we find to be the case. The overwhelming majority of constructions are exceedingly common. Hence, with years of practice, speech, uttered or unuttered, becomes fluent and intelligent. The mechanism is such that we readily predict this result. Examine the sentence: "Where is my brother?" I wished to speak to him: but he was not where I expected him to be. So I asked the above question. Presupposing that all was normal, my query arose out of curiosity. As soon as I saw some one who might be able to give me the information, the quoted words developed. I did not hesitate a moment. There was no perceptible building up of a structure. The words were well known to me; I was used to asking questions; and curiosity had often moved me. The only problem which remains, then, is to account for the sentence as such. The first word I had employed on many occasions in a similar way, *viz.*, "*where* are you?" or "*where* has he placed the box?" That word would, therefore, on account of organised reaction, spring up at once when there was a question of whereabouts. The second one has been used even more frequently, *viz.*, "Aunt Lucy *is* here," "Who *is* there?" "What *is* there?" However, not only have these two letters, *is*, found their way into similar constructions; they have many times been employed in the manner here illustrated. "Where-is" is a common form. Hence, on the recurrence of a similar occasion a similar phrase, such as "where-is," is re-integrated. What I remarked as to the first two words holds good of the third. It is often used like this: "What is *my* sister doing?" "*My* brother is here," etc. As with *is*, so with *my*. "Where-is-my," "What-is-my," "When-is-my," "It-is-my," are every-day expressions. Hence "Where-is-my" is re-produced as one phrase. If organised trends be a fact, this must be so. There will be no piecemeal elaboration where the necessity for it is wanting, and where a form is treasured up in the memory. And, lastly, the whole phrase is probably re-developed as it stands, because, like many others, it is often employed or heard, as "Where-is-my-brother?" We not only learn sentences by constructing them, but by coming across them in social intercourse or in books.

The stock of sentences or portions of sentences thus known amounts perhaps to scores of thousands, and, considering that the constructions are frequently employed, this sum is not extravagant. There is an almost countless army of them. Glance at the following few lines which I drop upon blindly, so as to exclude choice. "This is precisely what we find to be the case. The overwhelming majority of constructions are exceedingly common. Hence, with years of practice, speech, uttered or unuttered, becomes fluent and intelligent." None of these three sentences can be safely looked upon as merely re-developed. The structure of the first sentence is "This-is precisely what-we-find-to-be the-case," or "This-is-precisely what-we-find-to-be the-case." The thought being common, the phrase is so also. The second will read "The overwhelming majority-of constructions are exceedingly-common." In sentences like this last one, words such as the fifth and the seventh often vary. This is true of many adjectives, adverbs and other parts of speech. The choice lies usually in three or four possible and known alternatives, and should their number be large, it takes an appreciable time to select the appropriate one. The third and last sentence is more difficult than the first two; but on the whole, nevertheless, the analysis of the other sentences applies absolutely. The construction is either common or there is special effort, or else an appreciable period elapses before the sentence is completed. Thus it is only natural that one who has had exceptional opportunities should have fair command over his tongue or his pen, a large vocabulary and considerable facility in the manipulation of complicated sentences.

The contention for which I have been arguing is so generally true that it would be tedious to push the examination farther. Fluency of language can be without reservation accounted for organically. It is well within the acknowledged powers of the human nervous system, and makes no greater demand on need-determined re-development than can be satisfactorily met.

Let us take one example of the elaboration of sentences implying much thought. I ask some one what Casuistry is. After a little reflection he replies "Casuistry is the art which deals with ethical difficulties." How did these words fall together? At first sight the labour involved in composing the answer appears fabulous; but it is not so as a matter of fact, for it is evolved by organised trends. Being accustomed to the general methods of definition, he at once starts with the word to be defined. In all but exceptional instances that is undoubtedly the first word of the answer. Given the noun singular, and the verb "is" follows as it has so often done before. Similarly with the "the." We possess now "Casuistry-is-the." Here he halts. Two words can only suggest themselves Art and Science. A knowledge of the subject soon makes it clear that casuistry has the features of an art and not those of a science, for the difference between these two has often perplexed him till he has learned the distinction thoroughly. "Casuistry-is-the art" will, therefore, be uttered readily. What immediately follows depends somewhat on the personal equation. Probably most persons have sets of words which they employ on such occasions. Instead of "which deals with," he might choose "that treats of." His choice is limited and within that range organised reaction has singled out one or two for use. Thus "Casuistry-is-the art which-deals-with" should be fired off quickly enough. The final two words are, of course, the most difficult to obtain. What happens here, is that by need-satisfying reaction we re-member what is the most salient feature—the phrase or set of words most often repeated. According to our knowledge of the subject and our skill in definition, the answer emerges more or less reluctantly. The notion of casuistry dealing with difficulties must have often occurred to him, and there could be no doubt that the difficulties were of an ethical nature. Thus the answer "Casuistry-is-the art which-deals with ethical difficulties" is reached. The possibilities of error and selection were moderate. He is not obliged to run hurriedly over a huge array of words, for there is practically no choice. Perhaps on some previous occasion he has read that "Chemistry is the science which deals with . . ." Now he just places "Casuistry" where "Chemistry" stood, and "art" for "science." Language, we see, is an acquired instrument. This is soon proved negatively. A person who is not accustomed to definition or to precise language, and has no knowledge of the subject, will wander in thought. He will probably decline to attempt a definition, and if he tries, there is little doubt that the result will be disappointing. He must practically be in possession of the phrase if he is to be successful. A definition is a form into which a special thought is thrown. A Member of Parliament asking a supplementary question in the House of Commons; a public man proposing a resolution; a solicitor preparing an affidavit; a poet writing verse, offer illustrations of the same truth. Only he is ready with words, who has the words ready. If we fail to propose a well worded resolution at a public meeting it is not necessarily because we lack some innate power; it is almost certainly because we have had no relevant training.

In agreement with the above we must never assume complexity, except where we meet with intense and continued effort. When a man is asked whether he knows French, we should not forthwith think that he is going over all his work so as to give a satisfactory reply, for if that were so, we should be bound to seek for a more subtle theory than the one here propounded. If reference to a campaign implied the total re-development in a moment's time of all we ever knew of it, our present explanations would miserably fail. The student of French, as a matter of fact, has most likely been asked or has asked himself the question pretty frequently. He has often compared his knowledge with that of the writer of his Grammars, or with the fluency of Frenchmen. While acquiring the language, he has again and again considered the question more or less deliberately. He has perhaps been told that when he could read Victor Hugo's *Notre Dame* with ease, and had mastered the grammar, he would then be a good French scholar. His judgment is also called into requisition. He has had many opportunities of deciding when a thing is well known or not. The instance, from a general standpoint, is a common one, and, again, where the student is not prepared for the question, he either declines to answer or fails to give a satisfactory reply.

Seemingly complex instances are to be dealt with as above. If in answer to a question I assert that a book is good, I do not review in thought all that I have read. To speak truly, I have probably forgotten most of the details. The impression grew on me as I read; I noted perhaps the uniformly fine style; or I re-integrated in reading more of what is valuable than I usually do with books of that class. Whatever the reasons, an immediate and accurate reply only results when there is nothing left to do but to polish a sentence.

The elaborate structure of language, with its enormous implications, is the result of slow and organised development.

216.—A Bird's Eye View.

Theoretically it might well be contended that most individuals differ from one another very considerably, while some immeasurably surpass the rest. Examination shows, however, that personal capacity mainly depends on the desire and the ability to absorb and elaborate the accumulated intellectual treasures of the environment, and that where little has been accumulated, genius of every kind is out of the question. We have also seen how the fundamental fact of equal incapacity is accounted for by the intricacy of truths, by the nature of organised reaction, and by the existence of changing needs. To these same factors the remarkable stability as well as the narrow range of individual character has been traced. Finally, I have pointed out the manner in which the infant develops into the man.

CHAPTER X

SYSTEMS AS CLASSIFIED

As our efforts rise or fall,
So our thoughts prove great or small.

217.—HIGHEST PRODUCTS.

We cannot account for a perennial spring, or for the mind, by asserting that it is its nature to pour forth, to create, a constant supply. The previous chapters have shown that the present, as a whole, is the organic outcome of the past; that our wisdom and our tendencies are as much an organic growth as the trees which pelt us in the autumn with their leaves. Recognising, therefore, that spontaneity is a myth, and that our psychic form and complexion is an intricately elaborated product, we at once ask the concrete question: "What is the known process which gives birth to high mental results in general, or, let us say, the last chapter in particular?" To answer, that the preceding chapter was not spontaneously evolved, but that it depended on organic developments, as shown in the portion of the work which went before, is not the explanation we are seeking. Following that principle, we should still be in the dark as to the concrete happenings when a problem of importance is solved. To put the matter plainly: Did I sit down at my desk, take pen and paper, and write off the chapter as readily as an organ-grinder turns the handle of his organ?

Our previous investigations have dealt either with general facts or with microscopic sections; but now we are considering concrete problems. The question asked at the conclusion of the last paragraph cannot be answered deductively, and we must, therefore, examine its precise implications. Many journalists are known to dictate lengthy articles with at least apparent composure and undoubted readiness; they neither stop to think nor to correct: they "go right on." Some novelists are said to write with the same ease and fluency. One author is thus supposed to have written a book, with the help of phonographs, shorthand clerks, etc., in about three days. In every such event ready-formed notions, convictions and practice contribute to the result. It would be surprising to hear that Plato's *Republic* or Spinoza's *Ethics* were holiday exercises, completed within a week or two; that Tennyson's *In Memoriam* or Virgil's *Æneid* had been dictated, without preparation, to shorthand writers at the moderate speed of eighty words a minute, and published without correction. We know of no great book composed in this way. It is more common to hear of slowly-moving years spent in the making of a profound work. Leaving journalistic fluency unexamined here, let us consider our example, the last chapter.

When its theme suggested itself, I did not sit down and mechanically finish the chapter in so many hours of continuous labour. Perhaps a year before I began to write it, the notion of treating the topic occurred to me. Being most of my time otherwise engaged, I only thought of it occasionally. I noted facts scattered here and there. I now and then re-developed something relevant to its issues. I occupied myself casually with it sometimes for a few seconds, sometimes for a few minutes and sometimes for a quarter of an hour. As time advanced, more seconds and minutes and quarter-hours were given to the topic. Lastly, for about three months most of my leisure—often hours together, frequently stolen moments—was absorbed in understanding and framing the task. During that period my world was a magnet attracting whatever bore on my purpose. Everything suggested the problem of the Individual. It was the one thing to which the nervous system was specially alive. As we know, the very fact that I occupied myself almost exclusively with it, gave the notion importance and momentum (sec. 111). It was this concentration upon it which obscured all other problems, which suppressed other lines of interconnection or reasoning, which made it the centre of the universe of interests, which enabled it to fill every pause between thought and thought, and which gave it the power spontaneously to present itself day and night.

Then came the actual composition. The *pros* and *cons* had been repeatedly weighed. This was omitted, this reinstated, this added, this corrected and that reviewed. With increased intimacy, came general conclusions of a more and more comprehensive order, and, at last, the various notions found their place in an all-embracing system. Writing proceeded now, with the help of notes and occasional re-examinations, pretty briskly, so many pages per day. Yet not a few difficulties required to be cleared up; many a sentence had to be re-shapen, and many a word discarded in favour of a more correct or expressive one. At the same time the concentration of thought was much more exhaustive than that observed in routine activity. Again and again I wandered off to side issues, or dwelt on chance objects in the environment, or entertained myself with idle fancies, or pondered over what I was writing. At last, the concluding word was reached. I then read the whole composition over again several times, correcting, adding, omitting and re-modelling. From this point my interest in the chapter gradually waned. Just occasionally I tapped its bars and wheels with the hammer of reason, and mended a flaw where I discovered one. The whole chapter was probably re-written—once, twice, who knows how many times—advantage being taken, of course, of the work already accomplished.

All writers do not adopt the same methods. Their end is reached by divergent ways. This, however, does not affect our position, for the point to be emphasised is that, for the purposes of psychology, an examination of a written essay conveys no notion of the many thoughts that were entertained by the essayist relative to his subject. Psychologically the exclusive examination of *The Origin of Species*, or the *Principia*, is an unwarrantable proceeding, for it yields us no insight into the concrete processes of psychology. The logician may examine your written reasoning, the lover of literature your style, and the moralist the ethical value of your contribution; but one who is interested in the concrete problems of psychology must regard books as one and only one of very many expressions of a man. He must take into account the general nature of intellectual growth, the method by which the individual has acquired skill in the use of his tools, and, lastly, the actual quantity of thinking connected with the final output. If we once consider the book by itself, and apart from the above factors, we are landed into formal psychology, which is nothing but formal fiction. Overlook the concrete building up, and you misstate the issue. I repeat, the workings of thought cannot be understood or deduced by examining their products in the last stage of development. It is to an abstract view, such as we are here condemning, that we owe the stringent divisions of the faculties, the conception of a pure reason, the notion of a self, the mind's atomic mechanism and forces. Great attempts, using the expression in an elastic manner, must be thought of in relation to the process by which they evolved: allowance must be made in the first place for the acquired aptitude, and in the next, for the precise development of the particular book, picture or product generally. A mechanical method of thought does not exist.

The highest class of thought, as we have seen, is not developed without much strenuousness. Sub-conscious thought, therefore, except in a very restricted sense, plays a small part in the life of the intellect. The factors to be considered in this respect are the following. We are positively dependent on others for almost our entire intellectual furniture (secs. 97 and 210), and consequently if we were left to ourselves, sub-conscious thought could not raise us much above the level of idiocy. As regards any capacities which the adult may possess, these are also impossible without the assumption of a development extending over many years. Sub-conscious thought accordingly has only minor significance; but it may be said to exist under certain circumstances, as when we are influenced by a partial withdrawal of the attention (sec. 19), by what is recent (sec. 110a), by the momentum of an act (sec. [illegible]), by dim ideas (sec. 126), by a mood (sec. 109), by indirect suggestions (sec. 129), or by intimate knowledge (sec. 215). It may also be noticed when we are trying hard to re-collect, for strenuous thought is merely the cross-classification of memories (sec. 102). These factors, however, as also the existence of needs, have a conscious counterpart and are ever-present, and can, therefore, only lead to a theory of a conscious *and* a sub-conscious aspect of thought. The plain fact seems to be that there are no prolonged or complicated processes of thought taking place sub-consciously. Where, as in sensation and thought, much remains partly undiscriminated, we have not a question of sub-consciousness, but one of not co-relating various facts, *e.g.*, the muscular strain in the eye is only co-related with the guidance of eye movements.

218.—Deliberate Action, Speech and Thought.

There is, of course, no theoretical distinction between the concrete thought treated of in the preceding section, and that referred to here. We build up walls of separation for practical purposes alone, and we cut out sections from various parts of the thought continuum so as to obtain an intimate view of concrete thinking.

Let us consider an example. A master is telling his class a story from Daudet. Examining closely his words and sentences, we do not notice anything ambiguous in the expressions. The flow is so even that the tale would be readable if directly transferred to print. There has been but slight preparation. Probably notes were made, possibly not. Perhaps the story has been read more than once with a view to selecting the suitable portions. Except with an expert story teller, some such preparation must precede the recital. Then comes the telling of the tale. The high quality of the account is no necessary reflex of the teller's concrete thought. Being a teacher, he watches his class while speaking. Finding himself not entirely absorbed in his narration, he now and again takes notice of various matters in his environment. Perhaps the noises from the street, his own voice, or the lights and shades playing round his pupils' lips, distract his attention on various occasions without breaking into his word-fence. Perhaps one listener seems much interested, a fact which gives him pleasure; while another, showing lack of interest, puzzles him. He may have felt annoyed with himself because he cannot tell the story as he would like. Such conditions as these are more than likely to be present.

While to all appearance the words are streaming forth with ease, the thought proper is not running so smooth a course. Something or other suggests irrelevant lines of thought which, though dismissed, continue to recur. Then, he often had to decide which of two courses to follow. Shall he leave this out, or insert that? Shall he point the moral of this or that incident? Will this prove amusing? What will be the effect of that? Not unfrequently he adds a sentence or two of mere padding to procure himself the necessary breathing space in which to arrive at some decision or to give a fresh turn to the story. Many a word is repented of or criticised. If, again, the master is a visualiser, he will, while talking, see many a scene in his mind's eye. Image after image will be developed; sound after sound, heard only by himself, will be detected. Then, too, he will feel what he is telling. Now he is slow and heavy, now quick and light, according as the story affects him. Suppressed imagery, thought and argument, both relevant and irrelevant, accompany his speech.

The master's attitude is that of deliberateness. Scarcely a word or a sentence is uttered, but passes the lips grudgingly. Everything is checked, as if custom-house officers were stationed there for the purpose. It is vigilance which raised the general quality of the recital, and increased effort along the whole line regulates the direction of word and thought. The slow speech which marks the man of deliberation, unaware though he may be of the fact, is owing to the turnstile click-click of anxiety which has become highly organised.

Though the story teller reflects the concrete state more faithfully as compared with the chapter we discussed in the last section, we have not yet obtained a photograph of human reaction. The telling of the tale suggests an order, a correctness, a facility, a directness, an even temper, an absence of effort, an unpreparedness, which are belied by the facts. Were we to engrave the sum total on an ideograph, if that were possible, how confusing it would be to the bystander, how different from the story as usually heard or read. Yet, as psychologists, it is precisely the sum total which we must be concerned with, if we are to avoid baseless conclusions. [*Experimentally verify the above.*]

219.—AVERAGE THOUGHT.

The less deliberate our actions are, the less amenable are they to inspection. The changes which the thought series undergoes from moment to moment are difficult to observe. When we suddenly turn our attention to the thoughts which have just passed, we, as a rule, fail to re-develop anything. [*Is this so with you?*] The bird of fancy is timid, and takes to flight when approached. Passing thoughts resent being focussed. We must, therefore, make our attention a very delicate instrument; our harking backward must be circumspect, so that we may observe without disappointment. We must be trained to veer round slowly, not violently; and abstract no more energy from the brain process than is absolutely necessary. [*Note this.*] Prolonged discipline will yield that ease and minimum of effort which alone enable us to do our detective work efficiently.

Let us examine an instance. One evening, after dark, I am walking along the road. Suddenly, in the quiet manner indicated, it occurs to me to retrace my thought movements, and I determine to start from the time when I passed certain bushes a minute ago. Standing under an electric street lamp I write down what happened. It runs as follows: "Looking at the bushes. It does look like candles. No, perhaps not; Oh! the resemblance is sufficient. 'The candles of the Spring are lit.' X. says about candles not being common—might be light, gas, or something—how would 'candelabra of the Spring are lit'—are lit or are being lit. Is candelabra the best word? Does it convey the meaning? Perhaps it is the best word (63 words)." [*Experiment in this direction.*]

The bushes which I passed, and which I sometimes pass every day for weeks together, originally suggested the line quoted. The criticism referred to was made about eight hours before, and similar criticisms I had heard previously. Therefore, on seeing the bushes, I not infrequently think over the line. The first remark "It does look like candles" conveys no more than a percentage of the thought involved. The sight of the diminutive perpendicular sprays suggested to me innumerable tapers, standing upright. Probably that vision vaguely embraced memories difficult to localise.

Then, too, the sense of resemblance is a kind of wavering, with an inclination to one side—a rapid interchange of inarticulate Yeas and Nays, with the emphasis on the Yeas. This state represents oscillations, proceeding at about the rate of eight or ten a second. What is true of the first sentence holds good of the others. The thoughts are gradually and forcibly developed. The doubts, the affirmations, the negations, the ponderings, were accompanied by a slight and yet sensible strain. There was an almost unceasing effort to think reasonably, so as not to be led away by irrelevant suggestions from the environment and otherwise. The feeling which is specially noticed with heightened exertion was almost constant. Numerically speaking, therefore, about thirty efforts were made in the minute which passed; and yet the minute's thought looks very much like an average of mental process. Still, the examination yields further material. Not being engrossed in the train of thought, I must have heard much noise, seen many things, and felt not a little. When intensely in earnest hardly anything is heard, seen or felt; but ordinarily the environment and the bodily organs distinctly affect us. Being engaged in thought, the sounds are not classified: the noise of wheels, the jolting of cars, the tramping of horses, the cries of vendors, and other sounds, are not considered in connection with a context. They are sounds and nothing else. The jolting no more suggests the sight of a van than it does the notion of the evolution of vehicular traffic in relation to civilisation. We distinguish a familiar sound, and there are no thoughts whatever connected with what is heard. We trace no notion of familiarity, of time, of space, of form, of part and whole, or of like or dislike. All these are so many additional notions of which we are not necessarily aware. In the normal state there is always some detail connected with what is heard. As our thought absorbs more attention, so the sound of the car is gradually reduced to a vague featureless sound which finally ceases to impress us as a sound at all. So is it also with sight and other systems. We must not imagine, therefore, that life is crowded with vast thought complexes, for what happens from moment to moment is analysable. It is not necessary to maintain that we face a gigantic complex when we say: "The candles of the Spring are being lit." No image of a candle developed at that time. It is hardly necessary to say that the heat, the feel, the physical and chemical nature, and the history of candles and their relation to other things, were not before me. As we learnt in sec. 215, the swiftness and the discrimination with which we utter a sentence, bear witness that it was not spontaneously created. Making this allowance, we assert, that, from the point of view of the feelings, an uttered sentence is best thought of as a nervous product, the precise manner of production being yet unknown. The assumption of vague depths of feeling into which the simple words send their many roots, is unwarrantable. Compared to the nervous system, feelings are extremely simple, and that which they contain can be analysed almost exhaustively by a careful experimentalist.

It is necessarily very difficult perhaps impossible, to re-develop even five minutes' thought in undoubted completeness, and it is questionable whether the sum total of one minute's systems can be re-integrated; but even if that be so, we need by no means despair. We may overcome the obstacle by taking a large number of observations at random, comparing them, and seeing whether the result is compatible with the rest of our knowledge. There is still another alternative. It is probable that exceptional persons may so train themselves as to follow the play of thought in its entirety for some seconds. With the attention shedding its light on the facts, they will be more easily and more faithfully re-produced, and after a few seconds—say ten—recorded. For a fuller account of the workings of thought such comprehensive search is sadly required. [*The enthusiastic student should come to the rescue.*] We could then tell better what it is exactly that occupies us normally. In principle, attending to the object of our attention is comparatively easy. It only becomes difficult when we insist on observing everything without exception in a section of thought.*

We have analysed one example, and for general purposes and in view of the limitations of space that must suffice. We have noted the incompleteness of language, thought and imagery, and we know consequently that a striking contrast exists between normal reflection and the written expression of the highest thought. Strenuous effort is absent in the former case, where the thoughts flow freely. In the latter case, on the other hand, we, like Alpine climbers, advance cautiously.

Thought is frequently wordless. [*Is this so with you?*] For example, I am thinking of a certain person and note the following images. I see him sitting in a certain room; then standing; then talking; then walking; then being introduced; then in some other place on various well defined occasions and in a variety of postures. Then I re-develop his house and scenes therein; persons he is acquainted with; and the like (sec 120b). It must be noted that there is no connection virtually or in time between image and image, nor are they related internally by similarity; the need alone rules the series. The contiguous and the similar, in the ordinary sense, are excluded. This class of thought is by far the quickest. With me, at least, two-thirds of a second, would be a maximum average for the development of each picture [*and with you?*]; while what is thoroughly familiar and serially related, like shops in a street, may require less than one-tenth of a second for each picture. [*Test this.*] These images, again, are not usually complete. We obtain just a hint, a faint sketch, of what interests us.

What is true of visual thought, is true generally. [*Is it?*] According to occasion and idiosyncrasy thought is more or less broken, more or less like a mosaic the various colours of which are supplied by the various senses. As we saw in the illustration which we specially analysed, feeling plays an important part when we investigate the smallest particles of thought.

The examples quoted in connection with these three sections must be taken to be selections from a large stock. For adequate exposition twenty or thirty pages of illustrations would scarcely have been sufficient, and those chosen should, therefore, be regarded as typical rather than exhaustive. We see, then, that strain and completeness are a sign of highly developed thought. The vocabulary, the sentences, the similes, the logical exactitude, the appearance of system, all prove this. On the contrary, in our normal private meditations, laxity and incompleteness are the rule. A single feeling, a solitary image, will in this case stand for what could only be expressed by sheets of paper and repeated reflections. As we have observed, ideal thought as embodied in men's best work, is not an even outpouring. It implies long preparation and careful correction. By parity of reasoning, therefore, we recognise that sections of normal ideation will, on the whole, lack originality and system. Similiar stimuli make us dwell over and over again on the same subjects, or else we merely give a passing thought to whatever our environment presents us with. This is the more natural as, according to sec. 134, constant reiteration alone enables us to preserve our multifarious acquisitions. Were we not readily to attend to them, they would drop out of the memory. Besides, great strain being excluded as a constant, what has happened recently, combined with established and superficial interests, holds us enchained. So also with the absence of system and completeness; while the normal strain is too petty for them, the struggle for existence among the units of thought and action imposes a time limit to every thought.

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* The more familiar a passage of thought is the more easily can it be observed or re-developed in completeness.

220.—Afferent Activity.*

We reached, in the last section, the domain of psychological thinking. Before we proceed to examine lower orders of combinations, we will investigate a few fundamental questions.

I sit in a chair in which head, limbs and body are easily rested. [*Repeat.*] I remain immoveable for a while, thereby making sure that only a minimum of intra-organic and extra-organic incidents are registered. The fixed eyes in the motionless head soon exhaust what faces them (ch. 2), since the position permits no variety of visual information. The outside world is only nominally represented, and my thoughts are not occupied with external objects. Imagine now that I am thinking of the tenets of a certain school of philosophy. At some point comes a dilemma; for a moment thought is suspended; I knit the brows, and continue to think. I wish a little later to understand a knotty problem; but, being baffled, there is another blind stare—this time without effect. Ordinarily, under such circumstances, we clutch at some afferent or inflowing modification, regain our equilibrium in this way, and re-commence our search for a solution; but afferent or incoming activity is excluded by consent. Assuming that I keep my fixed position with perfect steadiness, the result will be that I become sleepy or self-hypnotised. [*Test this.*] The stream of thought, like any stream, requires constant feeding, if it is not to cease. It will not move of itself; it has to be perennially stimulated from without. Why that is, the physiologist must answer. We only know that, when a train of thought is interrupted by an insurmountable obstacle, thinking tends to stop unless the body is thrown into agitation or the senses fill the gap. When, therefore, the stream of thought has ceased to flow on account of the supply being stopped, it becomes, as we should expect, a dry river bed. This, however, is not all, for we also desire to know whether pure thinking, which so soon lapses into inanity when not stimulated from without, will start of itself. The above contention shows that the contrary is the case. The current of thought is not only maintained by afferent activity, but is set going by it in the first instance. [*Observe.*] Once we are asleep we should very likely never wake again, unless we were afferently roused. *Thought, therefore, is only possible when we are in unceasing contact with our environment*, and afferent impulses, therefore, must be regarded as an indispensable condition of the thinking process. In their absence, functioning is impossible. Thought does not keep itself alive by a force which dwells within. Its fires are fed by the senses. No senses, no thought. [*Is that so?*]

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* On the whole subject of afferent, efferent and central activity see Bain, *The Senses and the Intellect*, 1894, ch. 1.

We excluded in this experiment the more obvious bodily motions. To be strict, we ought to discourage all movement, palpable or not. We should, therefore, refrain from knitting our brows, setting our teeth, fixing our eyes, or increasing in any way the susceptibility of the senses. To act as suggested is to shun effort; and, since inner effort is nearly a constant, thought, but for neural tone, will be suspended almost immediately when we become perfectly still. [*Test this.*] Special training is required in order to accomplish our object with ease, while under certain circumstances we shall be more successful. An illustration of the first category is to be found in those individuals who have been repeatedly hypnotised; of the second, in the state of the body before sleep. In the latter case, it is the fact with many that they are no sooner still than sleep supervenes. [*Observe.*]

From the general premiss it follows that a life is not complete unless it has allotted to it a proper share of afferent activity. *In ch. 9 we already saw that the bulk of leading notions are taken from the environment, and that the individual, at his best, can add but a mite to the general store. Thought is, therefore, doubly dependent on the atmosphere from which it derives its nourishment.*

Some interesting facts can be brought forward in illustration. Many have been the harrowing pictures drawn of the horrors of solitary confinement. Men break down physically and otherwise under the treatment, and it is touching to read the stories told in this connection. A prisoner makes friends with a young rat. He tames it; he brings it up; he shares with it his food and drink; and he plays with it. When his comrade is discovered, he, with tears in his eyes, begs for permission to keep it. Though he is otherwise obstinate, the threat to remove his companion brings him to sub-mission. Why has solitary confinement such strange consequences? I answer, because the nervous system is too much left to its own resources. Why, again, is a rat which is petted, or a strip of soil which is cultivated, so great a blessing? We reply, because they yield constant food to the attention. Often when a thought haunts us, external occupation drives it away, and hence *new views keep our old ones sweet by preventing monotonous repetition.* Manifold interests remove over-attention, while regular work relieves the strain of abstract thought. In the absence of liberty, therefore, we pine. Give the thinker paper and ink, and his cell becomes for a time his study. He exercises his brain and plies his pen. He keeps himself sound by exploiting past afferent or ingoing impressions. Yet since memories lapse unless frequently re-instated, and since the environment of a prisoner is too restricted to suggest much, the stores will shrink and the thoughts will wander.

Similar conditions give rise to similar results. Those who live in the country and do not interest themselves in nature, affairs or books, are in a position resembling that of the prisoner. To them town with its afferent attractions, the theatre, the concert, the visit, the street bustle,—is something to be desired. Were they to take a living interest in nature, their organic wants would be satisfied; so also would they be, if village politics, or sports or books appealed to them. The dulness of the country only makes itself felt in those to whom nature's happenings are a manuscript where the writing is blurred. In any case, the conditions of content or discontent are the same, and travel, therefore, owes its fascination to the wealth of afferent charms which it yields.

The monotony which is produced by division of labour needs only to be mentioned for us to recognise therein the lack of a variety of outer influences. The recurrent actions, claiming very little attention and that in one direction only, tiring because of their persistency, and supplying little or no new material to the nervous system as a whole, do not satisfy the normal cravings, and hence a general mental torpor ensues. Not being permitted to fall asleep, the labourer sinks to a lower level of being. [*Observe the effects of monotony.*]

For this reason the child who is constitutionally eager for facts because its outlook is yet very limited, throws away its doll and hugs a piece of wood, or neglects the clock-work mouse with its monotonously repeated movements, and takes to playing with live cats and dogs. The child requires a ceaseless stream of fresh information, and naturally tires of an object such as a toy animal which is for ever feebly nodding its head. Sand, therefore, is the child's ideal companion. [*Watch children at play.*]

All forms of art and sport satisfy primarily because they occupy the attention. As the next chapter will be devoted to proving this, we may close the subject of afferent activity.*

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* Dugald Stewart (*Elements*, 1808, pp. 328-9) already saw a portion of the truth contended for in this section. He holds, for example, that relaxation of the attention, ceasing to act and think, and listening to monotonous sounds, induce sleep. The dependence of

As attention implies direction of activity, so sensory or afferent attention implies sense activity to a certain extent. In seeing, for instance, the ocular mechanism is at work, and the visual results will accord with the line of its activity. So with all the senses, and also with efferent and central activity. Attention in every case argues some bodily movement or adjustment. As Mach says: "It seems to me a very plausible contention that the attention is quite generally traceable to the mechanism of the body. If nervous work is proceeding along certain lines, then the nature of the mechanism bars work along other lines. And what holds of sensory impressions, probably holds of thought. Thinking may be regarded as change in attention" (*Zur Theorie des Gehororgans*, 1863, vol. 48, part 2, p. 297). Consequently we shall understand the nature of attention when the bodily mechanism is well known; but meanwhile there can be no doubt as to the quantity of attention being rigorously defined. On the physiological side another factor in attention is readily explained. In the normal waking state the organism is always braced up, alert, ready to react, prepared for making an effort, and the same holds good of the attention under the same circumstances, to a similar extent, and presumably for the same reasons. We have to consider, therefore, not only the *direction* but also the *tone* of attention. As the tone is marked, so successful efforts of attention are assured, while absence of a high attentional tone will mean painful effort and insignificant results. This is obvious when we observe that in sensing and in thinking muscular strain is an essential [*Experiment*], and that accordingly a low tone of the muscular system generally means also a low attentional tone. For the same reason, too, the field of thought and memory, both as regards extent and rate of change, will be the same in almost every respect with the field of observation, and that because the same factors are involved in both fields (sec. 120). Lastly, just as every activity implies a modicum of tone, so also in attention strain or tone is an essential factor.

221.—Efferent Activity.

While employing such terms as afferent and efferent, or incoming and outgoing, it must be distinctly understood that these processes do not exclude central nervous influences, for sensibility is the result both of central and afferent activity. Images are never presented *to* us, for the images are part of us. In every instance the waves of light or sound are only some of the conditions necessary to sight and hearing. Thus, when we speak of afferent or efferent activity, it must be understood that central activity is one of the factors in every reaction.

Efferent or motor action does but subserve afferent or sensory action, and is really a help to it. To content ourselves with watching what happens and hearing of what takes place, keeps us beggarly in intellect, for speculation can tell us so little that we cannot trust to it for our supplies. To overcome these hindrances we actively interfere with the process of the suns. For instance, we attend a lecture on Chemistry, and are told what to do in the laboratory. We see with our own eyes how the lecturer manipulates the substances, and then we experiment ourselves. We are astonished how often we fail; how inordinately long each experiment lasts; but as time goes on, laboratory work becomes easy. It is difficult, there-

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central activity on afferent or inflowing stimulation is discussed by Pflüger, *Theorie des Schlafes*, 1875; Heubel, *Die Abhängigkeit des wachen Gehirnzustandes von äusseren Regungen*, 1877; Strümpell, *Ein Beitrag zur Theorie des Schlafes*, 1877; and Foster, *Physiology*, 1897, § 690. Tissié (*Les Rêves*, 1890, p. 183) also remarks that "all our dreams are provoked by an initiating sensory impression, even as are our thoughts in the waking condition."

fore, to conceive the tons of information which would be an adequate substitute for ounces of practice, while in addition there are personal problems which others cannot solve for us.

In afferent activity there is always efferent action, as in the adjustment of the eyes, the head, the body and the limbs. Without such movements we should notice almost nothing. [*Verify this.*] In complex motions, such as are implied in experiments, in travels, in protracted observations, in work, we meet the conditions most favourable to afferent activity. Thus the child's *playing* with the sand on the sea-shore gives him the widest scope as regards afferent possibilities. Looking at a heap of sand he learns hardly anything; playing with it, he receives a wealth of information. Efferency and afferency are thus complementary, at least so far as continued sanity is concerned. Both together yield the ideal result.

The system of motion which is expressed in efferency of itself demands exercise. Not to employ the muscles is to allow them to deteriorate, and that, in its turn, makes physical activity on a larger scale difficult while it originates diseases which affect our vigour. *Work*, in the widest sense, *is hence one of the prime necessities of our being.* Not to work, is to cease to exist, even if we do not take central nervous activity into consideration. Afferency is essential, and since efferency is one with it in purpose, the one becomes as necessary as the other. The existence of needs alone is more fundamental in that it conditions both sets of actions by supplying a constant and uniform momentum. [*Study the motor factor in observation.*]

222.—CENTRAL ACTIVITY.

We saw, in sec. 219, how, in random thought, we are occupied in observing and passing in review what has previously been a centre of attention. We also insisted in the last section that reaction is always partly central. This last point should be deliberately recognised. We must not allow for a moment that because very little attention is employed in vision, therefore a visual system is an "impression" or a "presentation" in the literal sense of the word. If this be clear, the next stage is to recognise the place of deliberation or endeavour. We have seen how little effort is expended in average thinking as compared with the highest classes of thought, and how, since sensible effort is almost synonymous with deliberation, such effort may be regarded as an essential of vigorous thinking. When we consider that firm endeavour transforms what is normally feeble, haphazard and wilful, into something with at least the semblance of strenuousness and system, we may concede that afferency and efferency are but a part of a greater whole.

Well directed effort is an indispensable condition of strength. We are not warranted in assuming that there is a single human being who forthwith, or with perfect ease, understands every problem which crosses his track. Pausing over difficulties, keeping them deliberately before us, alone tightens our grip. We cannot learn to do by seeing alone; we must practise. So, also, undigested observation can never raise us to a high intellectual level.

It is melancholy to observe rational creatures absorbed week after week in magazines and reviews, day after day in political events, and hour after hour in questions of conduct, and this for a life time, without appreciable growth of insight. A few years' honest work to start with, or a little occasional hard reading and hard thinking, would have immeasurably increased the value of their reflections. As it is, their notions are ever performing some fantastic war dance. The wings of their thought have no power nor skill. They are tossed about helplessly like a dead insect in a gale.

The highest forms of thought imply that primary and secondary systems are ceaselessly ordered and re-ordered; that we constantly have recourse to effort in order to give our thought true sequence and method. Superficial reading of books, magazines, and papers; attending lectures of a so-called popular character, travelling, or going into society, will have scarcely any effect in raising the quality of thought. Training or deliberate exercise alone fits men to rise in the scale of existence. [*Is that so?*] Afferent, efferent and central activity must be combined to give thought its maximum value. We need hardly repeat that these three are one in any combination. [*Test the central factor.*]

223.—'TWIXT WAKING AND SLEEPING.

Thus far I have maintained that impressions, presentations and perceptions are unrealities if we abstract central activity. We will now investigate experimentally the extent of our power to mould the primary and secondary material.

Most persons are able to discern faces in the smoke-stains on ceilings, the veining on doors, or the designs in wall-papers. [*Are you?*] Starting from this minimum I attempt to see faces. Wherever irregular lines exist, and there are few places where they do not, the human countenance appears. The clouds which had previously suggested steam, masses of snow, or mountain ranges, teem now with living outlines. Everywhere without exception, after a few months' practice, I member known and unknown features. At last, it requires special effort to avoid the annoyance produced by these arbitrary shapes. [*Repeat the experiment.*]

To make my investigation a little less wearisome I chiefly experiment with the clouds, since these do not often claim the attention. No longer satisfied with building up human faces, I come to integrate full-sized human beings, lions, tigers and other animals, both in part and as a whole. To the menagerie I add specimens from the vegetable kingdom, from art and from inorganic nature. Later, I see the forms in any proportion I please.

I endeavour now to transform one shape into another. Where I see a lion, for instance, I develop successively object after object that I am bent on imagining. I continue experimenting till I am confirmed in my success.

Lastly, I attempt to construct figures from a minimum of outlines. With nothing but a straight line before me, I can only construct a serpent, a reed or some similar object, and I cannot see the straight line as a circle or a square cabinet. With an uneven line a variety of images can be constructed. Three points, with an indifferent background, allow considerable scope to the imagination; but always within the limits of the outlines. In no case do we find images to which there are no corresponding outlines. Similarly, the colours we observe are those of the object, and flat outlines yield at first two-dimensional forms.

We conclude, then, that the imagination when turned outwards, freely creates forms, which are bound by the given figures; their colour and their flatness. [*Test this.*]

Looking at these experiments in the light of the second chapter it becomes manifest that they illustrate a general principle. *All pre-developing and re-developing is primarily imaginative or neural.* The lion's head which I see in the clouds, is formed by me neurally exactly as is the so-called real lion which I may have seen in the desert. In both cases we pick out the features which we choose to dwell on; and in both cases the object is equally real or unreal. The differences are practical and not theoretical. They are determined by social agreement, by the desire for the satisfaction of needs, and, in part, by hereditary predilections. The brain's activity is essentially like that of the sculptor's. Its works, like his, are without exception, art-products.

When Spitta (*Schlaf- und Traumzustande*, 1882, p. 87) says that "in our dreams, as in matters of temperament, we each dwell in our own world," he is correct so far as social conventions, strengthened by hereditary tendencies, are concerned, though it is as true to say that each lives in his own world whilst awake. Stout (*Manual*, 1899, p. 318) agrees with our position, holding that "in general, whatever appears to the perceptual consciousness as separate is so because it is a centre of practical interest."

I might even go farther. A little effort would soon enable me to transform solid objects into solid shapes, and I might also succeed in giving body to two-dimensioned outlines. I could, finally, by the same rules, see the imaginary objects in motion. My experiments are few in that direction because of the danger to sanity. I observe just sufficient to make sure of the possibility and, indeed, we can deduce these steps from our premisses without going to the data. However, it is so important to preserve a normal grasp of facts that nothing but very serious considerations should persuade a man to indulge freely in such activity.

We now experiment with eyes shut. One would think that closing the eyelids produces the "darkness which the blind do see" (Shakespeare, Sonnet 27); but an appeal to the facts soon convinces us of Shakespeare's error. Looking straight before us, when our eyes are shut, we observe various things according to the light surrounding us. With the summer sun shining on the face, we observe a rose-coloured ocean of fire in violent agitation. [*Test.*] The colours change with changes in our activity. If we, under the above circumstances, pass a hand over the eyes, the flaming field of sight becomes comparatively dark, and when the light is entirely excluded, we note only a dark screen with lighter points and lines, reminding us of a woven sheet.* Turning our closed eyes upwards, downwards or sideways the field of view changes [*Test*] and with changed conditions the colours vary indefinitely. Hence up, down, right, left, may have a meaning for us even with eyes closed. [*Test.*] Looking at the sun for a moment and then closing the eyes, we observe sometimes, especially when tired, a number of tiny suns which pass through a series of beautiful colours. [*Test.*] *The dark field is of the same texture as the void which we see in a very dark place with our eyes open;* for instance, in looking into a box at night or passing through a long railway tunnel. [*Test.*] Only when one eye is closed is there total absence of vision in that part. [*Test.*]

If, then, outlines are available, experimental figures will be possible. I try, therefore, to construct definite objects in the retinal or closed-eye field of vision. This experiment is more easily described than carried out. The whole of my energy is often wasted in preventing the eyelids from opening. Frequently, again, I find myself dozing off in the attempt. Sometimes, also, imagination pure and simple is mistaken for observation.

If we, however, look upon these difficulties as overcome, we then encounter the last and greatest obstacle. The outlines are sometimes overwhelming in quantity, and are seemingly on the move without ceasing. Success here is most difficult, and it is only now and then that, after much effort, we develop objects suggested by our fancy. There are, however, three points to notice, namely the field of vision appears to have volume, colour and movement. [*Test.*] If, therefore, we fully succeed, we shall be able to obtain a close imitation of reality, the imagination possessing here an ideally plastic material for its purposes.

In the normal waking state these experiments have remained disappointing. Some shape or other is formed on occasion, and this is sufficient to prove our contention; but these shapes usually lack liveliness. We, therefore, watch ourselves going to sleep. We find that as we withdraw from the outer world, the imagination is for a while arrested by the closed-eye field of vision. [*Repeat the experiments.*] Perhaps I awake fifteen times or more in a forty minutes' afternoon experiment. On each of these occasions arbitrary figures and scenes are, as it were, created; but only a few can be re-developed after I wake, although I have pencil and open note book lying close by me. The pictures are seen abruptly, and at the moment where we usually plunge into sleep proper. Now it is a cow running through a wood, or men-of-war at sea, or a bedstead, or a well, or a curious bird flying, or a rocky shore, and the like. Around the sight grows up a story, and that, with the picture and other systems, is the dream. The more we study these phantasms, the more evident does it become that they are painted on the canvas of the dark field. When once we have fixed them in the memory, they are re-producible in perfection. They exhibit the features which dream pictures possess. Their externality and likeness to life are the direct result of the impress of the imagination on the plastic, occasionally coloured, and three-dimensioned mass. Yet on occasion, when exceptionally fortunate or after long training, we may obtain complete experimental proof, for in the transition between waking and sleeping we can sometimes remain fully alert, studying and shifting the images at will.* Thus I see a forest, which changes into a view of the roofs and spires of a town, which becomes again a large human crowd, and so on. [*Test.*] In such instances we observe the oneness of waking and non-waking closed-eye images.

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* Fechner speaks in this connection of light-dust.

Gothe had already referred to these phantasms. Gruithuisen has vague allusions to our subject in his *Beyträge*, 1812, pp. 58-61, and pp. 362-72. Johannes Müller (*Ueber die phantastischen Gesichtserscheinungen*, 1826) made an exhaustive study of the subject, which has not yet been equalled. He describes the phantasms in detail (p. 21). He can see them in the day-time when he shuts his eyes and becomes absorbed (p. 21). The will cannot produce them arbitrarily in normal cases (p. 23). Our dream-pictures are but a continuation of slumber pictures (p. 24). The latter mostly appear suddenly, and are one with the blots of light (pp. 29-30). "Dream-pictures are nothing but the luminous phantasms which, before falling asleep, are to be seen when the eyes are closed" (p. 49). In these states we can see things which we have never seen in the outer world nor shall ever see there (p. 100). Muller consistently and suggestively extends his application to the other senses, and to such phenomena as witchcraft, hypnotism, somnambulism, spiritualism and insanity. Burdach (*Physiologie*, iii, sec. ed., 1838) keeps close to Müller. He speaks of the slumber pictures as being the "elements of dream-life," and says that they are at first not regarded as real objects and that they form an introduction to dreams (§ 600). Maury (*Le Sommeil et les Rêves*, 1865) closely follows Burdach who followed Müller, adding nothing that is new. He, too, agrees that "hypnagogic hallucinations constitute the formative element in dreams" (p. 53); that at first we are not deceived (p. 53); and that the hallucinations are not restricted to the sense of sight (p. 54). From Maury's time up to the present little has been done save to quote him. I must, however, except an excellent note on visual dreams by Ladd (in *Mind*, 1892, pp. 299-304). The experimental method which is advocated in this work is successfully applied by him. He says "Almost without exception, when I am able to recall the visual images of my dream and to observe the character of the retinal field quickly enough to compare the two, the schemata of the luminous and coloured retinal phantasms afford the undoubted clue to the origin of the things just seen in my dream life," and he also tells us "that during the first hour or two of sleep, the relative sensitiveness of the soul to all intra-organic changes is greatly increased" (p. 301). In another place, Ladd (*Direct Control of the Retinal Field*, 1894) refers to deliberate and successful attempts to build up chosen pictures. Greenwood (*Imagination in Dreams*, 1894) considers that the slumber pictures are entirely independent of the will (p. 22); that they only consist of human faces (p. 24): and that they are independent of the memory (p. 18). As with so many writers on the subject, scarcely one of his contentions has general value. The very contrary of each one of his assertions as regards the originality, vividness and independence of slumber pictures, can be proved experimentally. See also Dearborn, *A Study of Imaginations*, 1898.

Let me record another experiment. In going to sleep I, for experimental purposes, repeatedly and deliberately open my eyes. [*Repeat.*] I detect a peculiar tendency of physical outlines to weave themselves into a pattern. White objects, such as a piece of paper, seem phosphorescent in their brightness: and an article of clothing close by appears as a patch of light on the wall, twelve feet beyond. The dimness alone does not account for what happens, because when wide awake and sitting in the dark, I have never suspected these vagaries of the imagination. So, again, waking in the morning I am wondering who has placed a strange brush on the table when the vision resolves itself into two books. Again, on another occasion, I imagine I see two of my manuscript books, when in the morning I discover I had mistaken a brush for them. Rousing myself repeatedly before going to sleep, or in the morning, I become accustomed to see semi-visions. Now I seem to see this person, and then that one. In the earlier experiments the illusion was never complete, except in one instance where the delight of facing a real phantasm roused me completely and dispelled the vision. But in every instance—I am speaking of what happened nearly every day for weeks—there were elements of a human figure so distinct that they could be traced in detail. On another occasion I discovered a Rembrandtesque figure. I saw the Rembrandt hat, the ruff, the coat, and the arm hanging down by the side. Each time I looked, the appearance was so distinct that it was difficult to see the objects in their normal guise. It takes some time to rid oneself of the phantasmal presence.

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* Herbart (*Lehrbuch*, 1816, p. 29) says that no one can observe himself falling asleep; and Cox (*Sleep and Dream*, 1878, p. 8) observes that "the passage from waking to sleeping is momentary." We have, on the contrary, seen reason to think that the passage is observable, and that the process is not momentary.

Here is a satisfactory case transcribed from my note book. "Early this morning I woke. I gather that I was not fully awake, since it was not easy to keep my eyes completely open. I saw in the room a nurse. I, then, experimentally imagined details of the figure. There was her dark cap, her eyes, her face, her ears, the hat ribbon, the neck, the cloak, and the girdle round her waist. In fact I was able to add any detail I pleased. The figure was lifelike; the facial expression pleasant. For a little while I also saw a woman, drawn on a two-thirds scale or less, and standing higher than the nurse, seemingly doing something to the latter's head-dress. It is surprising out of what unpromising material the nurse was formed, some clothes being the basis of the first figure. I think that the white lining of a waistcoat suggested the face of a nurse, and that I then selected the outlines, at first dreamily and afterwards with deliberation. I seemed to proceed as freely with my material as the potter with his clay. When I rose in the morning I could trace everything. The phantasm of the other figure was formed out of several objects on the mantel-piece about ten feet away, thus producing a complete illusion of distance. Just before rising, about 7 a.m., I had another hallucination, a very striking one. I saw the head of a warrior, cut as in adamant. He seemed to wear a low cap-like helmet. Underneath I saw his eyes and his eye-brows. He had a long straight nose, suggesting great power, a small protruding clean-cut mouth, and an incisive chin. The face looked massive and strong. I believe I was not clear whether it was a face itself or the vizor over it. I believe I was inclined to the latter view. On closely examining the groundwork, the nose appeared too long. It was probably that which suggested the vizor. Curiously enough the fawn-coloured material out of which the head was formed appeared verdigris in colour, which may have been suggested by the thought of a vizor, or *vice versa*. When I rose a little later, the apparition was still there." The "nurse" hallucination decides once for all the essential oneness of the open-eyed and close-eyed hallucinations of the period between sleeping and waking.

In the peculiar condition when closed-eye phantasms are normal, appearances of an abnormal character can also be witnessed, as we see, with the eyes open. The imagination, having become weak and wilful, follows only minor suggestions, and adapts everything to its own secret machinations. What we distinctly note once more is that these imaginings, however startling, are hewn out of the solid rock of primary systems. The outlines which appear, are not imaginary; they are real. The colour and the depth, too, are objective. With a little training it is not impossible to form three-dimensional shapes of every kind as freely as, when in dealing with clouds, we create two-dimensional ones.

Apart from experiment it is exceptional for people to wake when the conditions favour hallucinations. Hence many persons are not aware of ever having encountered even a single illusion of this nature. Others, again, are hallucinated when some organic stimulus wakes them in the midst of a dream or otherwise, or when some hope or danger, or the knowledge of a near death, for instance, disturbs the neural equilibrium. Naturally, *the images vary with acquired tendencies. Children frequently see grotesque figures; and so do savages. Custom and religion serve also as interpreters.* "We have a Greek who sees the shade of a drowned mariner mourning that he cannot cross the river Styx till his body is buried; or the phantom of an unbaptised child who bewails the misery of its suffering from having died before the rite necessary to salvation; or a Mussulman who sees in the jungles, or the desert, the green mantle of the Iman Ali mounted on his charger; or a Hindoo ghost who complains that low caste men have polluted his tomb" (Ireland, in Tuke's *Dictionary of Psychological Medicine*, 1892, ii, p. 1359, article "Visionary"). As with the quality of the apparitions, so with the quantity. *When conditions favour them, we have, as we should expect, an epidemic of visions and voices.* The uncultured individual, misinterpreting an unusual occurrence, gives it an objective explanation entirely out of accord with the imaginative influences which fashion it, and even provokes the physical state of semi-wakefulness (sec. 218).

A belief prevails that sane persons who are perfectly awake observe these appearances. This is, I consider, a mistake, based on hasty judgment. We seem to be awake, but are not. Here is an illustration. You are on a visit, and have an improvised bedroom allotted to you, which is so situated that it forms a passage to another bedroom. On several occasions, shortly after you retire, you hear the occupant of the latter room mount the stairs, open the door, pass through, and shut the second door. You usually turn round and watch him cross your room. At such times you are lying, apparently wide awake, thinking over the events of the day, wondering what the morrow will bring, or unravelling some problem.

You think yourself completely awake. You would smile at the suggestion that you are anything but alert; for what is to distinguish indubitable wakefulness if not calm and ordered thought? One evening, turning round to see your bodily familiar, he chances to ask you some simple question. You hear and understand what he says. Then you open your lips to reply, and . . . begin to utter incoherent sounds. Here is a second instance. I sit with my eyes shut, apparently fully awake. Some one enters the room, and, to my surprise, I find it almost impossible to open my eyes. Now since there is reason to believe that all hallucinations of the sane and healthy occur in this twilight state, I regard them as fully explained. [*Test this; try and find instances to the contrary.*]

I have only to add that what has been asserted generally as to sight, holds good of hearing and auditory hallucinations, and of the senses generally. [*Illustrate from sound hallucinations.*] There is no room to enlarge on the subject.

Johannes Müller (*Ueber die phantastischen Gesichtserscheinungen*, 1826, p. 75) allows for open-eyed visions, though he does not go into details. Delboeuf (*Une Hallucination à l'Etat Normal et Conscient*, 1885) describes a waking hallucination, without attempting to trace its origin. Marillier (*Quelques Cas d'Hallucination*, 1886) recounts a number of his own hallucinations, remarking that no direct differentiation is possible between reality and hallucination. Marillier's case is not easily explained by my own principles. I must also refer to a series of articles in *The Ethical World* (1898-9) on "The Case against Telepathy," where I make an attempt to explain the current stories of telepathic hallucinations at the time of death.

The distinction between a hallucination and an illusion is supposed to be that in the latter case an object is present and that in the former an object is absent. Baldwin (*Senses and Intellect*, 1890), for instance, says: "In hallucination, all extra-organic stimulation is wanting" (p. 259). So Simon (*Le Monde des Rêves*, 1882) writes "the state of hallucination consists in a sensorial perception without there being an exterior object to produce it" (pp. 98-9). Recent research has not favoured this rigid division.

224.—DREAMS.

Dreams form undoubtedly the lowest plane of thought. The reasoning in the waking state is generally lax; but never does it approach, except in the insane, the chaotic stupidity of the dream-state. Nay, were it not that we are often misled, we should learn that many of our dream-sayings are even less intelligent than we suppose them to be.

225.—EXTRA-ORGANIC STIMULI IN DREAMS.

Let us first consider instances where the afferent or outer influence is evident. I thought that somebody knocked at the street door, was admitted, and walked noisily up the stairs. (This dream would not claim more than a second or so.) I woke immediately, and noted that the policeman had roused some servant who was anxious to rise early; that he had been answered, and was tramping away. Similarly, a short time ago, I thought I saw some one I knew, a grave old gentleman, walk about his room, ringing a bell. [*Why the old gentleman?*] Waking, I observed that some early vendor was using that instrument of torture in the roadway. Again, one morning I dreamt that I was in a lecture room. Some one whom I knew was making a few pointed remarks, which, as far as I re-member them, were all nonsense. When he finished, there was general applause. Then all, except one, became silent. That solitary enthusiast declined to be subdued, and kept on stamping his feet. Various persons, among them the lecturer, approached, trying to reason with him, but in vain. [*Why did the story take just this form?*] Then I awoke, and discovered that, it being late, somebody in the room close to mine was knocking loudly on the wall. On another occasion I fancied that I was booking trains as they rolled noisily into a station. In the morning I was informed that there had been a terrific thunderstorm during the night. Thus I re-develop a dream-story where a pistol shot was the centre of a sensational occurrence the explanation of which I found, on waking, to be that some heavy object had fallen from the mantel-piece onto the brass fender. In this case, where the beginning forms the last act, we have to do with a perverse judgment. The noise is heard and the tale is woven around it,—a second or two is sufficient for this,—the feeble reason readily inventing a story to account for the afferent infliction.

The query in the text as to why the particular old gentleman appeared, raises an important question. It has been a standing subject of wonder why we do not generally dream about what occupies our minds seriously, and why we do dream about things of no importance. So Hildebrandt (*Der Traum*, 1881, pp. 11-3) mentions that passing things only are re-developed in dreams. Robert (*Der Traum als Naturnothwendigkeit erklärt*, 1886) has the following highly ingenious theory to account for the facts. That which is fully thought out, is not dreamt of (p. 10); but thoughts which have been only hurriedly or insufficiently attended to, form the matter of dream-life (p. 9). In the dream, the hurried thoughts are digested, and hence a man would go mad if he did not dream (p. 10). Should the dream-effort be insufficient, hurried thoughts will recur in the waking state (p. 21). Indeed, dreams are reappearances of suppressed thoughts (p. 26); they are safety-valves (p. 26); they "have a curative and relieving effect" (p. 32); to induce dreams would probably mean the curing of insanity (pp. 32-3); it is to them, and not to sleep, that the morning's freshness is due (pp. 37-8); they have, consistent with the theory, their origin in the waking state, though some images may be due to sensory stimulation (p. 48). In short, "the causes [of dreams] are always the same: the existence of undigested sense-perceptions or of uncompleted mental tasks" (p. 50). I have no doubt that Robert's view is to some extent correct. Already, in ch. 5, we saw that an undigested thought haunts us, and from that it is only fair to conclude that these thoughts will recur readily in the sleeping condition, since they are crowded out by urgent business in the waking state. To this extent Robert has vindicated his claim that dreams have some function allotted to them in the human economy. But no farther. I have specially tested the theory, with the following results. Undigested thoughts frequently vanish altogether; frequently they haunt us for very considerable periods; and frequently we recur to them in the waking state. On the other hand, in several cases where I have made attempts to re-develop the material of dreams, it has been evident that the thoughts or perceptions were in no exceptional sense hurried or undigested. Thus in one dream—evidently traceable to my struggling for breath under the bed-clothes—I could trace twelve memory pictures, all of recent origin. Each of these twelve I could account for completely, and not one of them bore the mark of hurriedness in any reasonable sense of that word. So in another dream I saw, while in some dream-thoroughfare, a large number of clocks on churches and other buildings; after which I noticed that the name of the street was "Uhrenstrasse" (Clock Street). The day before I had waited for some one at the corner of a thoroughfare, and could find no clock by which to verify the time. I also looked several times at the name of the street, "Newton Street," so as to be sure that there was no mistake. These events did not worry me; they were the result of a method which I quietly apply all day long. Robert's view, as a comprehensive theory, falls, therefore, to the ground.

There is no lack of other theories. Most of them assert that the Reason, the Understanding, the power of Comparison, the Will or the Higher Faculties are on leave, and that the Associative Process, the Fancy or the Imagination are on night duty. I dismiss these powers as being superfluous. Fechner (*Psychophysik*, 1860, pp. 522-3) holds that the dream-stage has traditions different from those of the waking state, and that it is without the education which we have had in the waking state; the dream life is different, in the sense that our country life may vary considerably from our town life. This view is in part correct, and I shall refer to it in sec. 230. Miss Calkins (*Statistics of Dreams*, 1893) also gives a good reason for the triviality of dreams. She says that the things which mean most to us are very complex "and depend for their reproduction on the integrity of very many lines of association" (p. 334). Leaving out her "lines," we can readily agree that the organic tone or effort which is involved, as we know, in waking thought, and which is absent in dream-thought, accounts for dreams being grotesque and useless. Hence all memory proper, except casual pictures, is excluded, and consequently we cannot live the waking state over again in our dream-life. To this must also be added that centres much used, tend to rest; and that, therefore, the dream-life would normally be free from the echoes of the day. Indeed, the very slightness of a passing impression or thought may, when the attention is at its lowest, make it more suitable for re-development. Besides, the live interest which we have in the dream-idea excludes acting over again our waking life, while the peculiar forms of the retinal pictures favour the formation of certain images rather than others.

The query with which we started is not yet answered: Why the particular image? Why the particular order of images? Bearing in mind what has been said, I can only add the following. I agree with Spitta (*Schlaf- und Traumzustände*, 1882) that the feelings (Gemüth) or, as we might say, our moods, persist to some extent day and night* (p. 116). When, then, the brain slumbers rather than sleeps, these moods will, in the ordinary way, give rise to images and feelings. The first portion of the process is easily explained. For example, as I sit reading, my elbow twitches, and, being a little alarmed, I instantly imagine that some one is gripping me. Such lightning images are frequently observable, especially when one's health is affected. Given, then, for instance, a similar sensation whilst sleeping and an explanation will soon announce itself; we shall act as the fancy dictates. But why the particular image of the old man? The reply, so far as I can yet see, must be that the connection was not close; that the old man tumbled upon the scene, rather than walked onto it. The memory strings being loose, what comes into the foreground is almost regularly out of place. Perhaps some blotches in the dark field strongly suggested the figure of the old man. Whatever it be, it is the business of psychology to find it out *by means of the experimental method.* Giessler (*Aus den Tiefen des Traumlebens*, 1890) has an excellent study of the point raised in this note. Tissié (*Les Rêves*, 1890, pp. 200-2) also connects certain classes of dreams with the abnormal state of different organs. Volkelt (*Die Traumphantasie*, 1875, pp. 43-85) interprets details of dreams by reference to bodily organs.

226.—INTRA-ORGANIC AND EFFERENT STIMULI IN DREAMS.

Systems originating within the body, or due to contact with the immediate surroundings, such as the bed, form a staple source of dream-life. I have already described the pictures seen at the moment of falling asleep.

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* See also Volkelt, *Die Traumphantasie*, 1875, pp. 109-15.

These have their origin presumably in afferency as much as ordinary vision, though there exist probably various types of dreamers. They are frequently the peg on which the dream is hung, or the charmed circle around which the dream-story moves. With me at least they are almost the normal introduction to sleep, though along with them, other influences, especially auditory ones, have initiative power. The heavy breathing suggests seething ocean waves. The beating of the pulse in the throat suggests men on the march, some one running, walking, writing or using a hammer,—in fact, every form of regular work. Especially are such suggestions rife when anything occasions the pulse to beat more loudly or more quickly.

Again, I have, so I believe, a fierce struggle with a man who nearly crushes me. I wake and find that my arm is resting heavily on my chest, and is the occasion of the unpleasant dream. Or I imagine that some one thrusts a knife into me, and on waking I detect a piercing sensation about the region of the heart. So I dream repeatedly that solely by stretching my hands and legs out straight I am able to fly in a slanting downward direction. After a time I discover whence the notion developed, and also connect it with the fact of extending the legs. I dream that some one has grasped my two hands, when I wake and find that I have the cramp in those parts. A man dreams that a bear is coming in at the window, and screams. Some one tries to rouse him; but the dreamer thinks the bear is laying hold of him, and becomes frantic. Thus I watch a friend dozing; suddenly his arm slips; he wakes, and, in reply to a question, he says that he imagined himself falling down the stairs, which could easily be imagined in half a second.

In by far the greater number of instances an organic stimulus may be at least surmised. For instance, I frequently dream that I am undressed or that I am dressing, and it is difficult not to link this with a superficial awareness of the fact that one is unclothed. The inability to satisfy ourselves in such cases and the consequent dream-developments are but a reflex of the unchanged stimulus. We cannot in the dream put our warm socks on, because the feet remain cold and uncovered. Hence a confused story, often lasting for a long time. Again, I repeatedly dream that I am thirsty and have something to drink, and so also with other necessities of nature; the want, under certain circumstances, gives rise to the corresponding dream.

The more carefully I record my dream-life the more I am convinced that at every point, with me at least, physical stimuli, combined with recent or permanent interests, originate and guide dreams. Take, for instance, one dream at random from my note book. I was, I don't know how, floating or moving along in a canal, holding on to some railings close by the water. I seemed to proceed with great rapidity and ease. Then the water became suddenly deep. S. (whom I have not seen for four years, but with whom I am in regular correspondence) was in front, and he swam. The water then appeared to rise to my mouth. Then dry land was espied, and the danger was somehow past. Then we entered a blind alley (the night before I had been in one). A number of persons were assembled, and some householder was good enough to let us pass through a door which led into a road." Why should I dream of a canal; why the extraordinary ease in movement; why the sudden slope in the canal bed; why the feeling about the mouth; and why the view of the dry land? The queries unmistakably find their answer in bodily developments which arbitrarily change, and which the imagination presses into its service. There is no logic connecting the parts of the story. Now take the second dream I lived through on the same night. "I dreamt that several of us were passing through a street, Miss X. among them (I had met her on the previous evening, and often see her). She was pushing herself alongside of the others (contrary to her character), thrusting me aside, when she fainted. I caught hold of her and shouted. At the same time she seemed (contrary to fact) a little thin woman of almost no weight, something like an India-rubber doll. Then I supported her head and shoulders; and C., aged 12, and T., aged 7, both of whom I see daily, held a leg each. I was angry with C. because he was carrying his burden anyhow, looking all the time at picture scraps (which latter thing he often does)." Here, also, as in the former dream, detail after detail suggests actual bodily developments. Looking over the notes of the third and the fourth dreams of that night, they read precisely as the first two. My notes generally, and the re-developed dreams of my childhood, bear equal testimony to the above interpretation. For example, I dream that I look at a disgusting spectacle which makes me feel sick, only to wake and learn that owing to a bad cold, my throat is full of mucus. The same night, and for the same reason, I dream that X. poisoned himself and that everybody advised him to take an emetic. Or, on another occasion, I think I feel hungry, and yet every dish inspires me, for the above reason, with loathing. I explain a multiplicity of dreams as having reference to severe colds and fits of indigestion. It also happens not infrequently that I dream of being sleepy or that it is very dark. Once I dreamt that I was running with extreme swiftness along roads and at night time, being totally unable to see any object and yet never colliding with anything.

Dreams of tastes and odours are universally acknowledged to be rare. Maury (*Le Sommeil et les Rêves*, 1865, pp. 132-4), Monroe (*A Study of Taste Dreams*, 1899), Ribot (*La Mémoire Affective*, 1894), Titchener (*Taste Dreams*, 1895), Weed, Hallam and Phinney (*A Study of Dream Consciousness*, 1896) are among the writers who mention experiments on the subject. Schwartzkopff (*Das Leben im Traum*, 1887, p. 13) believes that in dreams he tastes eatables and smells flowers.

Efferent activity also gives rise to dreams. Thus, moving my hand suddenly, I dream that I am opening a door. So, knocking the arm against some object, I dream of two men-of-war in collision.[*] Most important in this respect, however, is our mimic activity, as when in our dreams we either speak aloud or just move the tongue or lips. In either case, as with sight, an illusory reality is suggested. A vividness results which misleads the rudimentary judgment, even to the point of waking the sleeper. The action involved in scanning the closed-eye field of vision, and the mimic movements of the lips, limbs and organs, induce a belief in a reality which differs from the waking imagination where these movements are normally absent.

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[*] The Spanish American war was then proceeding; this and the preceding instance were experimental afternoon dreams, and are not distinguishable from night dreams. The influence of light in dream-vividness should be experimentally investigated.

227. THE PLACE OF REASON IN THE DREAM-STATE.

Let us now examine the place of reason in the dream-state. "I woke at 8 a.m., in the middle of a dream. I was walking along a hard, sandy country road and over viaducts. It was very dull, and also raining. Once I dropped my umbrella, nearly losing it. I wondered as I walked back for it, how one could let slip an umbrella in rainy weather. (It may have been raining during the dream.) Nothing appeared to be clearly discerned; I re-develop only the road. I was walking along a descending slope, it being nearly dark. Meeting two lads, I was going to ask them how far I was from my place of destination. I spoke to them, making several unsuccessful attempts, until at last I mumbled out: "Graz." (The evening before, two boys had asked me to direct them. Though I knew the locality well enough I could not re develop the street named. "Graz" is the place where an intimate friend resides.) In the distance I saw two square towers, but as in the dark. Then I met a man, aged about thirty, who told me I should have to retrace my steps as I had taken a wrong turning. He was travelling the same way, and so we kept on talking about one thing and another. We came near to a town. Before reaching it, my companion entered some building, while I waited outside. Then he called me, and I went in. It was a chapel; but it looked like a bare room. We went right to the front. There were two desks, square ones, which looked like packing cases, and faced the congregation. We sat down. The preacher stood a little to the left of us. I had only my felt slippers on. I did not kneel down. I could not find the place in the prayer book. The clergyman suddenly left, and my guide took his place. A radiantly blond and chubby fellow came up to me and said that *he* was ordered out for coming to church naked. I told my companion of this, and he replied that the man had frequently appeared in that way, being besides only a farm-labourer." To say that need-satisfying development was absent from this dream would be going too far. My reflections about the umbrella, my conversation with the stranger, my behaviour in the chapel, had reason in them. On the other hand, note that the word "Graz" was a chance shot, that the word "naked" was employed inexactly, which again implied a host of absurdities. The dimness of the towers, my not being able to find the right place in the prayer book, my meeting the lads and the stranger, the entering the chapel, the square desks, the clergyman leaving, the being remonstrated with, are all unreasonable circumstances. My attitude could not be accounted for except by assuming afferent influences constantly modifying the trend of what was after all a connected train of thought.

A dream is often much more grotesque than it appears to us when awake. We think that we are uttering a series of brilliant paradoxes when, on waking, we find that what we were saying was not even coherent. The many-syllabled words we employ suggest that we are drenching our companions with showers of magnificent thoughts. Hence an apparently intelligent conversation turns out to be sheer nonsense. I find many signs of that. The words "Graz" and "naked" are pertinent illustrations. So, dreaming that I am reading Spenser, I am astonished to meet with the word "bicycle." Evidently the reading was a jumble of miscellanies. Thus, I am disconcerted by some one urging something quite opposed to his usual views. Most likely a haphazard phrase arrested my attention. Again, dreaming that I am amanuensis to George Eliot, I note that the remarkable passages which she dictates are already known to me, and what is new is very poor. Lastly, I try in vain to make sense of a large poster which I am reading.*

Sometimes the reasoning is consistent. "I dreamt that I was out for a walk in a park. It was misty and dark. (Probably sleep had a fair hold on me.) A neighbour whom I did not personally know, nor recognise on reflection, and whom I need not describe, joined me. He asked me a question concerning the word 'which.' I explained that the *h* is to be pronounced before the *w*; that in Anglo-Saxon time it was so pronounced as well as written. I pointed out to him that in the middle ages *v* was written for *u*, that the double *v* or *w* was a double *u*; and that the sound of the *w* was as that of *u*. (I had lately been thinking about the connection between letters and sounds)." In this dream there is something like perfect unity. Not an incident which does not fit in. My notes contain only one other example of consecutive thought, though not so good as the instance just cited. As will be seen, my dreams are on a much lower level than ever, I hope, my thoughts are in the waking state. If but once my day-thoughts were as confused as my night-thoughts, I should tremble for my sanity. With some persons consistent dreaming is perhaps more common. In their case, they are sufficiently awake to think clearly. This, however, will be referred to again later (sec. 232).

As to the unreasonableness of dreams in general, there can be little doubt. German, French, English and American authors give exactly similar descriptions of the essential nature of the dream-state. Binz (*Ueber den Traum*, 1878, p. 33) is within bounds when he says that "among ten dreams, nine at least are absurd." So Macnish (*The Philosophy of Sleep*, 1830, p. 60) says that "the province of dreams is one of intense exaggeration—exaggeration beyond even the wildest conceptions of Oriental romance." So Mumford, *Waking, Sleeping and Dreaming*, 1893, p. 24: "If when awake we touch the cold iron of the bedstead, we see the cause; but when asleep, we think we are cast adrift upon an iceberg." So Sully, *Human Mind*, 1892, ii, p. 314: "Even the best of our dreaming is but a confused chaotic reminiscence of waking experience." Sometimes, however, problems are solved in dreams; forgotten things are re-developed; and poetry is composed.

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*Since writing the above, I have experimentally and exhaustively satisfied myself as to the general unreasonableness of dreams.

For my part, I have not infrequently believed myself to have performed intellectual feats in dream-life; when, however, I awoke, these feats proved tantalisingly absurd. Burdach (*Physiologie*, iii, 1838) recounts some striking dream-successes of his own, and Radestock (*Schlaf und Traum*, 1879), Abercrombie (*Inquiries*, 1838, pp. 289-91), as well as other writers, give a list of reasonable dreams. Such cases seem to show that those persons at those times were in a physical condition which widely differed from that of the ordinary dreamer. Reasonable dreams should be experimentally controlled. Cox (*Sleep and Dream*, 1878, p. 55) speaks of the "exaltation of the mental faculties generally" in dreams, and gives some doubtful instances in illustration. He forgets that the dream-stimuli are real, that illusions are constant and that day dreams are normal. Greenwood (*Imagination in Dreams*, 1894) believes that reasonable dreams are not rare. Of himself he writes: "Not rarely but commonly I have dreams which are throughout as consistent in scene and circumstance as any of Mr. Kipling's stories for example" (p. 170). Is this, perhaps, a sly hit at Mr. Kipling? I ask this because the dreams of his own which Greenwood recounts are of the quality only too common among common mortals. That rest, in the form of sleep or otherwise, is often necessary before thought becomes clear on an important issue, is universally admitted. Hence I should consider it likely that overnight the haze should pass and that the morning should have surprises in store. Accordingly, it is not unreasonable to assume, *wholly subject to experiment*, that dreams should occasionally contain a bright gem. So few, however, are the hits, and so enormous the number of misses, that we ought to be surprised at the trifling results of non-waking reflections.

228.—INFLUENCING THE DREAM-STATE.

It is worth while to consider the interaction between the waking and the dream-states.

Some years ago I left one country for another. Both the language and the environment were different in my new abode, yet for some two or three years at least, it was the old country, the old friends, the old tongue, the old customs, which monopolised dream-life. The recent did not exist for me when I had lapsed from the state of wakefulness. [*Settlers in a new country could verify this.*] I used often to wonder at the persistency of long-past happenings. This hold has not yet been completely relaxed, and occasionally even now the dream-environment is that of many years ago. Gradually, however, the more recent influences clamoured for admission to the stage. The old and the new mingled in clown-fashion. Persons who knew no English, spoke that language fluently, while English voices resounded in the streets of non-English cities. It was only after some years had passed that the new world of action entered into almost undisputed possession of the wizard's court.

What is true of this general change, applies equally to less sweeping transformations. The death of a mother or a brother is as a sealed letter to the dreamer for many months after the event. At first the sad event is entirely ignored. Later on, the figures appear seldom, since we think less frequently of them in our normal condition. Yet for many years afterwards friends, who are now permanent underground dwellers, re-appear in dreams as if they had never forsaken us. I cannot find in my notes more than one instance of a dream in which a death took place. This instance is too striking and recent to be passed over. "I dreamt confusedly that my mother was late in coming home; and that people said she was dead.

That seemed to me unreasonable. I saw then one phantasm and then a second. (I was then studying telepathy.) I became afraid. Somehow the conjectures proved correct; and I broke down completely and repeatedly in consequence. The explanation of the dream is simple. The previous day at noon some particles of dust had entered my eyes, and I was unable to dislodge them. During the night I woke several times on account of my eyes watering. Hence the tears in my dream. The continuous watering was interpreted as crying, and a story was developed to account for this." As with the dead, so with the living. Friends who are thousands of miles away, familiarly mix with those in our immediate surroundings. Relatives whom we have not seen for years, talk to us without causing any astonishment.

So is it also with dream-notions. Once the boyish spirit ruled. Any one who hurt us, our friends or our goods, was made to pay dearly for his audacity. We rated him, we fought him, and perhaps we went to the length of killing him. As we grow more sentimental, traces of the change are observed to trickle into the lower rivers of dream-life. If any one is angry with us, we try in an exaggerated style of friendliness to reason with him and calm his fury. In romantic fashion we refuse to stop the thief, or to return blow for blow. We allow ourselves to be operated upon like dogs in the vivisectionist's laboratory. When the captain asks for volunteers to lighten the overladen boat, we jump overboard without hesitation. These inspirations, however, do not embrace the whole dream-field. While one night chivalrous, the next night we more than fully assert our rights.

Take one special instance. For various reasons I have become a total abstainer from intoxicants. Shortly after my change, when in a dream I was thirsty or at table, I had my glass without any qualm of conscience. At last the message has reached the dreamer: Thou shalt not drink intoxicants. [*Deliberately suspend habits, and watch the dream-effect.*] Again and again I drink, and then am conscience-stricken. "Why did I drink it? Had I not said that I would never taste it again? What in heaven's name induced me to do it? Why did I break through my resolution?" The answers I tendered are often as interesting as the questions: "I had forgotten." "I was ill." "I required the potion." "I was persuaded to." "I wanted to take it." Gradually a startling and ingenious solution gains ground: "I have ceased to be an abstainer." I am, then, in the peculiar condition that while, in the waking state, I abstain from, and am never attracted by, intoxicants, as a dreamer I take them pretty freely—more freely than I ever did before I was an abstainer. The dream-personality here, as in other instances, differs from the normal individual. Were the question of drink displaced by that of purity, we should sententiously maintain that our failure was not due to psychological conditions, but to a depraved free will.

In the above instance there was no endeavour to deliberately influence the dream-state. But occasionally I have made experiments in that direction. [*So might the student.*] For example, before going to sleep I impressed on myself that I did not desire to dream of walking about in my night clothes, and, also, that I wished to wake when such a suggestion arose. At first, no effect was traceable. Then, in my dream, I reasoned that there was no harm in such conduct; then, that I have changed my opinion; then, that I have walked into the road while asleep; then, that I have been stripped of my clothes; then, that I have gone mad; then, that it was too hot; then, that I was in a tropical country, etc., etc. After each defeat I place the argument on the black list, and repeat it as a warning before saying good-bye to the waking state.* The resolution generally succeeds as far as conveying the message to the dreamer is concerned, though, as we see, it has no permanent effect. After many efforts, according to agreement, I wake or dismiss the subject. Then the notion slumbers for a time. I now discontinue my nightly resolutions, till the questionable dreams start once more. [*Experiment for yourself, keeping compact notes.*] Complete success I have never been able to boast of. Possibly, if systematic efforts were made to rationalise one's dream-life, they might be successful. As the matter stands, our influence is painfully limited. Probably indirect methods are discoverable which would effectually cope with the stubborn tendency to unreasonableness and, if necessary, even with dreams altogether.

The ethics of dream-life are a never-failing topic of discussion. Maury (*Le Sommeil et les Rêves*, 1865) thinks himself different awake from what he is when asleep. He says: "In my dreams I always succumb to evil inclinations" (p. 90). I am glad to say that I cannot subscribe to this. Hildebrandt (*Der Traum und seine Verwerthung für's Leben*, 1881, p. 52) strongly holds that our moral state in dream-life, as far as the initial motive is concerned, frequently reflects our character, and that dreams may often yield food for ethical reflection. Spitta (*Schlaf- und Traumzustände*, 1882) disagrees with Hildebrandt. We are, according to him, not responsible for our dreams. He often dreams of climbing mountains, a task to which he has a strong aversion (p. 187). When we are awake, objectionable thoughts are repressed; in sleep they become overpowering (p. 191). Spitta denies that we can tell a man's character from his dream-behaviour (p. 196). Bouillier (*De la Responsabilité Morale dans le Rêve*, 1883) holds that we are to some extent responsible. Haffner (*Schlafen und Träumen*, 1884), a Roman Catholic, asserts that there are no ethics in dream-life (p. 319). He says: "The greatest crimes which are committed during dream-life, and of which we accuse ourselves there and then, are as void of moral guilt as our most heroic dream-deeds are void of moral desert" (p. 319). Yet we are indirectly responsible. Schwartzkopff (*Das Leben im Traum*, 1887) returns to Hildebrandt's position. He holds that momentarily we often have bad thoughts in the waking state to which we pay no attention (p. 79). Pure men dream purely (p. 80). Lastly, we may mention Giessler who, in the last chapter of his book (*Aus den Tiefen des Traumlebens*, 1889), discusses the morality of dream-life.

Seeing that by general consent our dream-condition reflects our waking condition,—"the miser dreams of wealth, the lover of his mistress, the musician of melody, the philosopher of science, the merchant of trade, and the debtor of duns and bailiffs" (Macnish, *The Philosophy of Sleep*, 1830, pp. 64-5),—I am inclined to agree with Hildebrandt's and Schwartzkopff's moderate statements that there is some relation between dream-life ethics and those of the waking condition, just as there is a general relation between dream-life and the waking state.

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* Nelson (*The Study of Dreams*, 1888, p. 376) tells that he effectually learnt to dismiss objectionable dreams by recalling them before falling asleep. Abercrombie (*Inquiry*, 1838, p. 292) refers to the subject. Radestock (*Schlaf und Traum*, 1879, p. 151), however, says, that "we possess no power over dreams."

The proper course is to investigate dreams experimentally, testing the senses, the imagination and the judgment. Not until that is done can a science of psychology be satisfied. The difficulties are perhaps not greater than in rope walking or in fine mosaic work. We must bring to our attempted observations the smallest amount of attention which will enable us to register results. We must so train ourselves that our attention shall act almost mechanically. My own labours in this direction, if I exclude deliberate dozing for purposes of observation, have been scanty. A few times in going to sleep I have with great freedom observed what happened, and changed the dream-pictures experimentally; but of these occasions, which convinced me of the possibility of dream-experiment, I do not possess many notes. Here is one. "In composing myself to sleep last night, and while yet fully awake, the retinal images appeared to be very distinct. I could see, at will, any quantity of any class of tree or shrub. (I had spent that day of Spring in the country.) Everything was figured, and yet without much detail. I also saw any number of birds—they resembled dots—flying rapidly to and fro. Looking deliberately to the imaginary ground, the turf seemed very real, even to the green colour which I especially desired to see." In this, as in other experiments, I have noted that colour, except for shades of light and dark, is normally absent with me. I have also frequently analysed the material out of which the objects are composed. The lights and shades, again, appear to be manufactured at will. Concentration or movement of attention or a similar factor must account for this strange fact, the change in light taking place more readily as we approach deep sleep. The outlines themselves are usually the result of selection, and the form which the changing lines, dots and colours take, depends both on the kind of material present and on the trend of our thought. I have, however, observed that changes are freely inhibited and accelerated. It may be added that I have on several occasions attempted to distinguish between retinal vision and imagination. There seems to be a clear division between the two, my eyes appearing to turn inward and upward when it is a question of imagination, and outward when the dark field is explored. [*Question this.*] How far these two classes approach each other, or are represented in dreams, I do not know. For the same reason, I find it difficult to decide whether the eyeball is in motion in retinal vision, though the evidence certainly points that way. [*These various assertions might be separately put to the test by several advanced students.*]

My records include one experiment of another order. "In going home I seemed to lose myself, I did not know how. I stood in a square where everything looked neat and stately. The scene reminded me of a Continental city. It struck me vaguely that I was dreaming, and that I would test the reality of the architecture by examining it closely. Then, to my amazement, a pillar I looked at, or touched, began to twist, and everything which caught my fancy kept changing, convincing me that I was dreaming. The contortions of the houses were vivid and most ridiculous. It seemed to me as if I had touched the sheets, and as if these had transferred their plasticity to the picture."* The absence of localisation, of touch, etc., in dreams, is also traceable in the semi-waking condition. On two occasions (and many times since) I have, to my surprise, observed that when nearly asleep I could not tell the position of any part of the body; for instance, when I wished to ascertain where my arm was, I had to move it. [*Test this.*] I have also noted several times that I find it most difficult to tell whether my eyes are open or closed under the circumstances: I think that I have raised my eyelids and look around me when, in truth, they are closed; I try several times before I partially succeed; and to the end I am doubtful (sec. 19).

Nothing which can be considered adequate has yet been done to study dream-life experimentally. Muller, as we saw, very thoroughly observed the slumber pictures, but his was no experimental study. In the case of the ever-quoted Maury the experiments were on so limited a scale that they are of little importance. Ladd's note, based on the study of day dreams—the best and perhaps the only method for serious purposes—is excellent as far as it goes; but it does not go far. The quantitative school has scarcely done justice to this subject. Nelson (*A Study of Dreams*, 1888) attempts to show, in a mechanical manner, that a sex curve may be established as regards dreams both in man and woman. The most important study, however, is that of Miss Calkins, *Statistics of Dreams*, 1893, where 375 dreams, of two persons, are analysed.

The scholars of the psychological laboratory remind one of lawyers who, in quick succession, appear learned in a variety of subjects; or of restless individuals who can never settle down to a task. I speak strongly, because I feel that the era of stray and inconclusive essays must draw to an end. If it be an experimental study of dreams, let it be such truly. Let the facts be minutely studied and noted; let every state be experimentally produced; and, after sufficient study, we shall have an essay or a book worth reading; or if the results are doubtful, let the experiments be forgotten. For a psychologist to attack problem after problem, leaving each unchanged, is as idle as to sit by doing nothing. The psycho-physical school must determine whether its business is to drug the market with indecisive columns of figures, contrary to the traditions of science, or whether it is to advance psychology. If it is to be the latter, we must discourage statistical tit-bits.

In sec. 8 it was already pointed out that psychologists first lauded the quantitative method because that method was supposed to enable men to dispense with introspection; but that it gradually came to be felt that quantitative results were meaningless unless introspectively interpreted. Such books as Sanford's *Course in Experimental Psychology*, 1897-8, and Titchener's *Experimental Psychology*, 1901, take us a step farther, for they quietly dispense with the quantitative method altogether. This is a great gain. There is a likelihood now that we shall no more hear of years spent in idly repeating ill-conceived experiments, and that we shall no more be dazed by interminable rows of inconclusive figures. The danger, however, is that men will now entirely lose themselves in aimless observation. It is good to be exact, and it is well to simplify the experiments; but it is also necessary to vary the conditions incessantly, to be unhampered by untested theories, and to be ever aiming at generalisations. When psychologists will follow along this line, which is the line pursued by men of science generally, they will reach those valuable results which are the invariable reward of the application of the scientific method.

The suggestion to observe the nature of movement on the sleep border came from Bradley (*On the Failure of Movement in Dream*, 1894). I have also observed that both the muscular and sensory tone are greatly reduced under the circumstances: pinching, for instance, produces little or no effect. The subject is discussed towards the end of sec. 19.

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* I have frequently since made similar observations.

229.—THE ORIGIN OF DREAMS.

We have reviewed the facts of dream-life. There can be no question that dreams, when considered as a class, constitute only a lower category of thought. In many hundreds of observations I have not met with examples which display features requiring a treatment different from that of the waking state.[*] I assume, in consequence, that the conclusions arrived at in the preceding sections of this chapter are sufficient for our guidance.

We have learnt that in the absence of perceptible bodily motion thought cannot begin nor proceed. When we examine the collected materials which must verify or condemn our induction, we find them to be in full accord with our general conclusions. At every move in our investigation we have encountered afferent and efferent factors. Not only were the dreams started by some sense affection; but they were continually fed from without. Aware as we are that every kind of bodily development is able to start and rule a dream,—I have records of every class of sense dreams,—we can easily perceive the reason why many dreams appear to lack an objective factor. Difficult as it is to track dream by dream to its lair, we must nevertheless conclude, in view of the evidence, that, subject to the law of excitement (sec. 109), their origin is normally afferent, efferent or intra-organic. Experiment in the waking state has shown us that the flames of thought subside if not fanned without intermission by afferent influences. We are, therefore, bound to assert that "suspension of afferency equals the suspension of dreams."

We recognised the place of effort in the waking state. We agreed that highly developed products are dependent on hard labour, while ordinary organised reactions point to much less effort and consequently to a reduced class of thought. When we come to dream-life there is a great drop. The smooth plain of random fancies appears, when viewed from the much lower level of the dream-depression, as a rocky mountain. We find, accordingly, that effort is at its very lowest in the dream-state. To this we owe the confused flow of units or ideas, the unintelligible sentences, the ready determination of thought by chance systems of a primary and a secondary character, and the want of intelligent originality. Hence all strenuous thought is excluded, while memories dating far back are either not admitted or perverted. The brain is too low-toned to systematise the given data. Thought drifts along helplessly, catching at any suggestion however absurd.

The effort factor cannot be over-estimated. As we learnt in sec. 134, our efforts are as frequent as the tick of a telegraphic instrument in action. Again, effort enters to a tiring degree into strenuous thought, for there obscure or far off memories are required, and recent and well known ones have to be kept at arm's length. So important is this factor that consistent thought is hindered by a low state of health, and accordingly, when we are unwell, all sorts of irrelevancies and trivialities impede our thought. Things that, in a normal condition, we can dismiss, recur again and again till we are tired of dismissing them. Every attempt to pursue an issue is frustrated by fits of distraction. In normal life it is only after years of training that an objectionable thought can be prevented from developing if it is based upon some rooted need; but we can dismember it as soon as its development commences. At a restaurant I see the waiter approach, and I almost ask him for a plate of "Mr. Jones," of whom I am thinking. So, recalling Ladysmith and a bridge near by, I catch myself saying, Ladybridge. In dreams, where the position as to effort is changed, we expect curious results. Re-development will neither be pertinent nor extensive, and hallucinations will take its place. Thought will not be selective, but will be wandering, picking up any stray impression and vainly trying to fit it into the scheme of things. Since needs persist into the dream-life, notions of easily satisfying them will arise, and resist our feeble attempts at dismissal. With the strings relaxed and the sense of localisation gone, hallucinations of the various senses become the rule, and hence, again, the seeming reality of the dream-state. There is, as we see, a world of difference between the springs of normal thought and those of the dream-state.

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[*] Most writers on the subject fully agree that the facts of dream-life are to be explained on the same principles as those of the waking condition. Schwartzkopff (*Das Leben im Traum*, 1887) echoes this opinion when he asserts that, "as a whole, the elements of the waking state are found in the dream-condition" (p. 20); and on this principle he explains all that, in dreams, is unique, fanciful, disconnected, rapid and hazy (pp. 23-31).

Looking over my records, I observe that recent or recurrent events form, in disguise, no small share in the dream-economy, and if that be so, we should perhaps allow that under certain circumstances thought may be started centrally. Still, a recent or a recurrent happening is only a few degrees removed from one taking place now. The great wave of inrushing influences gives rise to smaller waves which, for a time, follow its track. It is, indeed, difficult to tell how far the dream-contents are recent, old or the result of hallucination; but the closer our analysis, the more we seem to find of the recent. Over and over again that which is strange is reducible to a compound of what is recent. There is only space to consider one example. "I dreamt I saw N. He asked Mrs. Z., in a very solemn manner, whether he could lend her any money. She replied she did not require any now; but he could bring some in ten years' time. N. is some one I well know. I spoke about his being ill to a mutual friend about 7 p.m. last night. Again, N. has intimate business relations with Mr. Z. But why was the name of Z. mentioned? This is very simple. Last night, about 10 p.m., I spoke to some one about a famous money lender. My companion thought that he was an Irishman, and suggested that his name was *Z.* First then floated in N.'s picture; then I dimly re-developed the usurer incident. Mr. Z., being an Irishman, a friend of N.'s, and the usurer's name having some resemblance to Z., the latter name developed.*

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* Words are thus frequently mistaken in dream-life, and help to add to the confusion.

"Mrs." was one of those slips which so frequently occur. I cannot re-develop seeing any lady. As Mrs. Z. is rich and N. very much the reverse, reason rebelling, Mrs. Z. declined. The "ten years" were the first words which shot up. Again, N. looked and spoke very gravely. Last Tuesday night I addressed a public body, and felt as grave. The only image of the dream which was re-developed was N.'s, the only one I knew, and he stood out strikingly clear." Apart from a very careful analysis dreams give no hint of what they owe to recency. We shall accept the fact that dream-existence draws nourishment mostly from what is recent.*

Granted now that extra-organic stimuli are necessary for dreams, as for thought generally, does that enable us to tell whether all sleep is full of dreams? A definite answer is impossible in the present state of knowledge. We know the chaos which rules dream-life and we are aware (ch. 2) of the condition of dozing when the world of thought is like the sounds emanating from an empty sea-shell. There is, therefore, no difficulty in conceiving a dreamless state, and the facts themselves, as far as known, certainly favour that hypothesis. The dreams are vivid in proportion to the length and breadth of the neural excitement. When at normal rest, therefore, we have every reason to surmise that sleep offers a blank from the point of view of dreaming, at least to the degree of excluding developed sense complexes and perceptible elaboration. The normal periods of dreaming, early in the evening or late in the morning, also favour the notion that only in ill-defined slumber do we dream. Besides, we are bound to assume that the effort necessary for consistent topical thought is absent in deep sleep.

In sec. 132 we learnt that there is generally no setting to our memories. This fact alone broadly distinguishes re-developed from pre-developed life. In the dream-condition this difference is obliterated in an ingenious fashion which powerfully aids the illusion of reality. The method is simple enough. *As our eyes turn in any direction, so an imaginary setting is constructed.* [*Test this.*] Dream-imagery is thus made to depart seriously from memory and waking imagination.

The importance of the manufactured setting can scarcely be over-estimated in an explanation of dream-life. Yet there is one further characteristic feature which we must notice. "I have observed during the last few days a new detail of dream-life. Last night I dreamt that I was approaching a horse (I did go up to a horse grazing in a field yesterday, about 4.40 p.m.). I was saying that I must be careful (so I said yesterday), *when the horse made a sudden grab at me.* About two nights back I dreamt that I was on a bridge, and saw one boat and then another, *and then there was a collision.* Then I wondered whether the bridge was safe, and *it at once began to appear defective.* The night before the last mentioned a horse escaped and I tried to prevent it coming into the house, yet *an opening*

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* See Max Giessler's admirable analysis of dream-life, in *Aus den Tiefen des Traumlebens*, 1890. It was his work which suggested to me the study of the recency factor.

was to be seen wherever I looked. Only this morning I had a similar dream. Something seemed loose in my bicycle. I then inspected the parts and wherever I looked, defects were observable. Looking over my notes, I observe a quantity of dreams of this nature. [*Verify in your own dream-life.*] Expressing this aspect in the most general form, we may say that dread, fear, hope, desire, anticipation, possibility, tend to actualise themselves in dream-land. In the waking state this is prevented, though in low nervous health the beginings are common with me. While I am awake, rising fears, etc., are usually suppressed, and often the steadiness of sun-braced thought negatives even the semblance of irrelevant considerations. In the relaxed condition of sleep, on the contrary, every class of suggestion, such as anxiety or hopefulness, has a natural tendency to realise itself, and is accentuated by the unfit state of the organism. Hence arises much of the originality and confusion of dream-life; the growth of settings; illusions of time and space; and the transformation of objects and scenes. Herein lies another telling difference between waking and dreaming.

Among physiologists generally it is held that the profoundness of sleep varies during the night. Michelson (*Die Tiefe des Schlafes*, 1897) offers an interesting study of this question, confirming experimentally the traditional views.* In accordance with this, psychologists generally hold that dreams only take place in those states which partake both of the waking and the sleeping condition. In deep sleep, thought, except that of the most rudimentary kind, is held to be absent. My own observations, which require experimental testing, coincide with the above opinions. Macnish (*Philosophy of Sleep*, 1830, p. 50) holds that "dreaming is a state of partial slumber." Chesley (*Does the Mind ever Sleep?* 1877, p. 75) says that "normally during slumber the mind is unconscious, . . . it neither thinks, feels, nor wills." Robert (*Der Traum*, 1886) claims that we only dream so far as we have undigested thoughts or sensations. Macfarlane (*Dreaming*, 1891) argues (p. 9) against Hamilton, and also contends that "it is during the intermediate states of falling asleep and waking that dreams most commonly occur" (p. 12). Goblot (*Sur le Souvenir du Rêve*, 1897, p. 329) says: "Each time that we remember a dream, that dream takes place not during sleep, but during the period of transition between sleeping and waking." On the other hand a number of writers contend for the opposite view. Hamilton (*Metaphysics*, 1877, i) leads the van. "We may, therefore, I think," he sums up, "assert, in general, that whether we recollect our dreams or not, we always dream" (pp. 323-4). The chief reason he alleges to be that whenever we are roused from deep sleep, we find ourselves dreaming (p. 323). Two answers have been given to this contention. The supposed general fact has been tested and proved fictitious; and, secondly, the act of rousing has been said to explain the dreams sometimes dreamt on such occasions. On Hamilton's side are ranked Macario, *Du Sommeil*, 1857, p. 22; Strümpell, *Die Natur und Entstehung der Träume*, 1874, p. 15; Cox, *Sleep and Dream*, 1878, p. 88; Julia Gulliver, *The Psychology of Dreams*, 1880, p. 209; and Hildebrandt, *Der Traum*, 1881, pp. 2-5. In this connection we may refer to Goblot (*Le Souvenir des Rêves*, 1896) who holds that "the dream *which we remember* is wrought in the waking state" (p. 288), and that what we dream during sleep is always forgotten (p. 290). These interesting assertions he bases on slender foundations. The matter, however, should be settled experimentally. See also Dugas, *Le Souvenir du Rêve*, 1897; and Egger, *Le Souvenir dans le Rêve*, 1898.

* On the question of sleep, see also Richardson, *The Phenomena of Sleep*, 1875; Preyer, *Ueber die Ursache des Schlafes*, 1877; and Rosenbaum, *Warum müssen wir schlafen?* 1892.

230.—THE HISTORY OF DREAM-LIFE.

As children we are naturally unable to distinguish between dreams and actuality, for to the child the world is one uniform tissue of fact. As we grow older, with no discipline and no effort to rationalise our dream world, the reckless judgments persist, the contents alone changing on account of the decay of memory (sec. 115). It is mostly our waking pictures that are transferred to our dreams; scarcely any of our training. To a large extent we still act in that state as strangely and as impulsively as children. We learn little as we grow to manhood, if we except a feeble reflection such as is offered by a turbid stream. There is in dream-life no bitter disappointment to make us ponder, no harsh criticism driving us to refashion our lines of thought, and no self-scrutiny suggesting improvements. There, thanks to a judgment unchecked by relevant memories, every problem is readily solved.* For this very reason we stagnate morally because we can close the door to afferent influences. Were our character exposed to the rude gaze of the world as our intellectual life is, and could we as little screen our moral as our rational defects, the race would ethically be as superior to that of the present day, as is our strenuous thought to that displayed in an average dream. We are dreamers so far as our more intimate life is concerned. The business of the pedagogue is to find a camera which shall reflect on a visible canvas the play of the soul, and which shall in this way admit afferent influences into morality.

231.—ADDITIONAL CONSIDERATIONS.

Accepting what has been said in the preceding sections, there yet remain sundry details to be considered. It is sometimes evident that the scenes in a dream appear to last for hours when but a few seconds have passed. What often happens and explains the great rapidity is that the dreams are ragged scraps which, like fallen leaves, are hurried along by gusts of feeling. According to the necessity of the drama and the fancied demands of logic the feelings give us an illusive notion of the time elapsed. Suppose that in the waking state we think of some one as crossing a room; we do not really see him move; we see one blurred picture, with which goes the attached summary feeling. The act which would occupy thirty seconds, we have imagined in a third of a second or less. Thus the sweep of the eye is to the imagination what bodily motion is to the reality. In a dream of twenty seconds a whole tragedy develops. We hence learn that our time illusions play as important a part as our visual or auditory illusions, and that, therefore, the lengths and lengths of country we traverse take but as many half seconds, as is shown by a study of re-developments of travel. It is very doubtful, however, whether normally the dream-process is rapid at all. [*Experiment in this direction.*]

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* I have already in a former note referred on this subject to Fechner (*Psychophysik*, 1860, ii, pp. 522-3) who had come to similar conclusions forty years ago.

The problem of the rapidity of dreams is one of the vexed questions of dream psychology. Maury raised the point by recounting his celebrated "Revolution" dream, and ever since attempts have been made to exhaust the subject. Stewart (*Elements*, 1808) had a simple solution of such rapidity. For him thought is so rapid that the swiftness of dreams raises no difficulty (p. 345). Hodgson (*Theory of Practice*, 1870, i, p. 446) says, having Maury's dream in view, that "dreams, when suggested by external agency, and referred to past time, are suggested in inverted order of time, which is corrected and changed into the real order of history by a process harmonising them with the order of events in actual life." Cox (*Sleep and Dream*, 1878) says that "the dreaming mind sets at defiance all the waking conceptions of time" (p. 54). Hildebrandt (*Der Traum*, 1881, pp. 24-5) holds that the swiftness is illusory, that it is produced by the sense of reality, and that the dream proceedings are no swifter than ordinary imaginative thought. He also suggests, on the strength of some observations, that the commencement of any dream which is due to sensory stimulation is not easily traced (pp. 39-40). Spitta, (*Schlaf und Traumzustände*, 1882, pp. 287-8) contends that, shortly before waking, two minutes are enough for the evolution of the most complicated dream. Schwartzkopff (*Das Leben im Traum*, 1887, pp. 68-72) argues that anxious moments seem to last an eternity; that when we are surprised, we tend to seek instantaneously for an explanation before the situation is yet clear to us, and that dream travels proceed no faster than thought travels. Baldwin (*Feeling and Will*, 1891, pp. 384-5) relates a story where the beats of a clock entered a dream, and in this way measured its length. This dream favours Hildebrandt's view of Maury's case. Mumford (*Waking, Sleeping, and Dreaming*, 1893, p. 26) quotes a striking instance where the noise of the pulled bell wire set the dream going, making it appear as if the dream had started simultaneously with the ringing bell. Le Lorrain (*De la Durée du Temps dans le Rêve*, 1894) argues that the guillotine incident in Maury's dream was the last stage in that dream, being merely added. Paul [illegible] (*De l'Activité de l'Esprit dans le Rêve*, 1894) refers to Maury rather inconclusively. Egger (*La Durée Apparente des Rêves*, 1895, pp. 41-4) argues that Maury's dream was not recorded at the time, and is hence unreliable. Maury argued backward from the severe blow which made him dream of the guillotine (p. 45). And, generally speaking, the retrospective explanatory matter in such dreams is afterwards added (p. 56). Lorrain (*Le [illegible]*, 1895, p. 60) claims that Maury probably made up the dream during the time which elapsed between the blow and the full state of waking. L. . . . D. . . . (in *Rev. Phil.*, 1895) suggests that the inciting event merely forms a later portion of Maury's dream. Clavière (in *Rev. Phil.*, 1897) gives a case where a dream could be proved to have lasted twenty-two seconds. Woodworth (*The Rapidity of Dreams*, 1897) supplies some experimental instances to show the great rapidity of picture thought in the waking state, arguing that the rapidity of dream incidents is not astonishing. [*The whole question should be decided experimentally.*]

The inanity of dream life lies in the imaginary solution of its difficulties. A hungry man who is awake thinks of banquets, but manages to discover some means of obtaining a crust of bread. In sleep he also feasts, is again hungry and feasts again, but on waking he learns that if the filling of his stomach depended on dreams he would die of starvation. Accordingly, together with an absence of awareness of the condition of things, there is in dream life almost invariably a fictitious solution. Men, therefore, become tired of re-producing, or dwelling on, dream-fancies, until a general tendency is established which prevents them from annoying our waking life. Their pretensions are unbounded; but in their performances we are offered a sunbeam for a marketable bar of gold.

The opinion expressed in the preceding paragraph is the one generally held. Few go so far as to assert with Binz (*Ueber den Traum*, 1878, p. 35) that dreams are always useless and frequently the sign of indisposition. Most writers rather agree with Hildebrandt that occasionally the hurried impressions of day life, which Robert (*Der Traum*, 1886, p. 34) speaks of, and which clarify in a dream, are of some value in giving us hints as regards our character or those of others we have met, as regards events imperfectly analysed, and as regards diseases which may be approaching (*Der Traum*, pp. 56-60). Greenwood (*Imagination in Dreams*, 1894) bitterly complains that "it has been decided by the scientific that dreams are entirely profitless" (p. 27). His complaint, however, is made regardless of the literature of the subject. Binz stands by himself in his pronouncement on the uselessness of dreams. On the other hand, my observations have put the value of dreams very near to the zero point. Greenwood's interesting comparison between day and night dreams (pp. 155-7) is misleading, since the former are immeasurably superior in value, and largely different in kind. My counsel to average dreamers would certainly be to ignore dreams.

Closely connected with the useful dreams just discussed, is the question of dreams which are supposed to open loopholes through which to catch glimpses of the otherwise hidden past, present and future. Most writers on dreams notice the subject, and give naturalistic explanations as, for instance, Abercrombie, *Inquiry*, 1838, pp. 276-85; Beneke, *Lehrbuch*, 1845, p. 293; Clodd, *Myths and Dreams*, 1885, pp. 236-44; Graffunder, *Traum und Traumdeutung*, 1894; Radestock, *Schlaf und Traum*, 1879; Robert, *Der Traum*, 1886, p. 34; Siebeck, *Das Traumleben*, 1877, pp. 30-4; Simon, *Le Monde des Rêves*, 1882, pp. 67-97; Spitta, *Schlaf- und Traumzustände*, 1882, pp. 309 ff; and Sully, *Illusions*, 1895, p. 147. On the mystic side we have Greenwood, *Imagination in Dreams*, 1894; Haffner, *Schlafen und Traumen*, 1884, pp. 323 to end; Macario, *Du Sommeil*, 1857, pp. 66-84; Pfaff, *Das Traumleben und seine Deutung*, 1868; Schmick, *Die naturliche Fortdauer der Personlichkeit*, 1891; Schubert, *Die Symbolik des Traumes*, 1840; and Ware, *Wonderful Dreams*, 1883.

I have also glanced at a few nondescript dream-books, designed for ordinary believers in the meaning of dreams. The value of these interpretations seems wholly dependent on belief in them. We read, for example, that to see a clock means that we shall be, we will say, successful in a love affair. If we are unbelievers, we are not likely to dream of clocks in any special connection, if at all. However, if dreams impress us, then the daylight hint of success in love will appear to us during the night in the form of our visionary clock. So also prophecies will frequently tend to fulfil themselves by urging the believer to action. As a whole, the dream-books appear to me void of any objective truth, being built upon a purely fanciful foundation. Most of the articles or objects mentioned by them, to judge from my dreams, never occur to those who know nothing of popular dream-interpretations. The dream-books create the dreams which they are supposed to explain.

Some accounts of wonderful dreams have little foundation in fact. For instance, Tissié (*Les Rêves*, 1890, p. 10) writes: "Burdach tells that he and his travelling companions, staying at an inn, all dreamt at the same time that they were on a rough road, bordered by precipices, and in the depth of night. The cause of all this was a storm which had broken over the inn." Here is evidently a case of undoubted transference of thought, for Burdach, the physiologist, is a witness whose word must be respected. When we turn to Tissié's authority, we find that Burdach tells quite a different tale. "'During a fierce storm at night nearly all the travellers in an inn dreamt that carriages and guests had arrived' [quoting H. Nudow, 1791]. While in an inn I dreamt during a storm that I had departed in the depth of night and was in a precipitous road by a deep chasm. My loud complaints [meine lauten Klagen darüber] induced the same dream in my travelling companion" (Burdach, *Physiologie*, iii, sec. ed., 1838, § 601).

The vividness of some dreams requires careful consideration. Often, indeed, our dream-environment is dark or undefined; but there are dream-situations which vie with waking life in clearness of outline. Closed-eye vision may sometimes account for this; but it is probable that there is an extra stimulus which brings about an added effect. In this connection there is at least one possible mistake against which we must guard; that is, we ought not to confound vivid with accurate vision, for the one does not involve the other. Judging by my records, minute detail is suggested rather than present in dream-life. My waking memory of extremely well known or recent events far surpasses in vividness the details of the dream-condition. For example, glancing at passers-by for half a second or so, I seem to re-develop clearly and faithfully the chief characteristics—chin, mouth, nose, eyes, beard, complexion, size, etc. The picture, except for its tendency to disappear, is not distinguishable in vividness or otherwise from the reality. This is even more fully seen in re-developing those I intimately know. Here the attention can be fixed on the image for a considerable period, because of the number of details with which I am acquainted.

There is considerable divergence of opinion as to the vividness of dreams. Schwartzkopff (*Das Leben im Traum*, 1887, pp. 10-3) contends that he sees scenes in full detail, colour and movement being faithfully represented, and that he also tastes and smells eatables, etc. Hildebrandt (*Der Traum*, 1881, pp. 40-1) describes the dream-figures as being painted grey on grey, the environment being veiled, sounds softened and clearness lacking. In a similar way, Huxley (*Hume*, 1879, p. 96) thinks that dream-pictures resemble the view we obtain from "out of the corner of the eye," and that our dream-pictures "are, in short, generic ideas of many past impressions." My own observations show no one type of vision. Sometimes, in dreams, total darkness reigns; sometimes things are believed in rather than seen; sometimes the light is indifferent; sometimes the illumination is of the same kind as that of good day-light; and not infrequently there is a peculiar glare. This last effect is the least realistic, for objects look semi-transparent, like reddish yellow wax in character, and phosphorescent. The colour seems the same as that which I see with eyes closed when the visual field appears bright: as when the sun's rays are piercing the eyelids.

It is generally admitted that dream-pictures are mainly visual, and it has also been shown that our dream-vision has an afferent origin. Hence, according to the state of the retina or other mechanism, we can let our fancy build up new shapes or transfigure known objects, as we may do with clouds, with burning coals or with grained doors. This explains whatever originality, vividness and detail is observable in dreams. It also supplies a reason for the difference between normal memory and dream-pictures; since the dream-pictures are partly suggested by the natural light-dust. As a matter of fact, except for general prostration, it is rather surprising that under the new conditions most persons are yet narrowly bound to their memories. It would, however, be going too far to assert without experimental verification that "the materials of our dreams are seen, when closely examined, to be drawn from our waking experience" (Sully, *Illusions*, 1895, p. 130). The truth is that there are considerable individual differences. Delboeuf (*Le Sommeil et les Rêves*, 1880) exaggerates appreciably. He says: "In dream-pictures, there is to be found nothing new, nothing actual" (p. 632); and, again: "The little which dream-life opens to us is sufficient to induce us to affirm that, in the world of thought, nothing is forgotten; everything is entered, classified and labelled" (p. 647).

Vividness is also said to be gained in other ways than those mentioned above. So Stewart (*Elements*, 1808, p. 344) rightly draws attention to the fact that engrossment produces liveliness, and is most favoured when the senses are asleep. Schwartzkopff (*Das Leben im Traum*, 1887, p. 40 and p. 51) substantially upholds the same view. Sully (*Illusions*, 1895, p. 138) also says that in dreams the "image will gain a preternatural force through the greatly narrowed range of attention." Delboeuf (*Le Sommeil et les Rêves*, 1879-80) holds, among other doubtful views, that "the perception and the conception of one and the same object cannot simultaneously co-exist in consciousness"

(1879, p. 496), and from this he deduces that dream-imagery must appear real to us. Taking a broad view, I am inclined to support Stewart's contention that absorption assists us in procuring the sense of reality in dreams. [*Experiment along this line.*]

We have assumed throughout that in dream-life we are always acting and never thinking; but this is only partially true. Careful observation shows that in dream-life we often re-develop occurrences, and that dream-events give rise to dream-reflection, dream-reasoning and dream-moralising. The dream-world, for this reason, is only an effeminate copy of the robust world of waking life.

Broadly speaking, we may sum up as follows: *we are stimulated into dreaming by afferent, intra-organic, efferent and recent reactions*[*]. *Effort being essential to strenuous developing and almost absent in sleep, the judgment and reasoning, or need-satisfying development, are considerably weakened, and hence follow hallucinations, the creation of settings, the introduction of irrelevant matter, the working out of faint suggestions, absence of muscular and sensory control and knowledge, and poorness of memory.* Finally, the dream-state may be defined as a state due to sensory stimulation in the first place; and, in the second, to a lowering of the muscular and sensory tone.

Further References on Sleep and Dreams.—Bertin, *Sommeil*, 1881; [illegible], *La Veille continuée dans le Sommeil*, 1881; Déchambre, *Songe*, 1881; Dugas, *Le Sommeil et la Cérébration Inconsciente*, 1897; Galton, *Inquiries*, 1883, pp. 155-77; Goblot, *Sur le Souvenir du Rêve*, 1897; Guardia, *La Personnalité dans les Rêves*, 1892; Hagen, *Psychologie und Psychiatrie*, 1844; Heerwagen, *Statistische Untersuchungen über Träume und Schlaf*, 1888; Hitschmann, *Ueber das Traumleben des Blinden*, 1894; Maillard, *Étude sur le Sommeil*, 1893; Manacéine, *Sleep: its Physiology, Pathology, Hygiene and Psychology*, 1897; Prévost, *Sur le Sommeil*, 1834; Purkinje, *Wachen, Schlaf, Traum, etc.*, 1846; Scholz, *Sleep and Dreams*, 1893; Sully, *The Laws of Dream Fancy*, 1877; Sykes, *Dreams*, 1883; Tannery, *Sur L'Activité de l'Esprit dans le Rêve*, 1894; Tannery, *Sur la Mémoire dans le Rêve*, 1898; and Vold, *Einige Experimente über Gesichtsbilder im Traum*, 1896.

232.—PROVOKED DREAMS AND RELATED FACTS[†]

In sec. 223 I spoke of phantasmal visions and voices which tend to break in on us in the state between wakefulness and sleep. The story of the brush indicated that occasional hallucinations were not infrequent in such a condition. At the same time experiment proves that what is usually exceptional will, if attention be paid to it, become as common as buttercups in May. We found proof of this when considering those historic periods during which mistaken hypotheses took the place of experiment, and we noted that during those periods visions were of frequent occurrence. When the transitional state is in this way exploited, we are justified in speaking of it as provoked. However, there are degrees of stimulation. In instances such as that of the Maid of Orleans, there is at least to begin with apparent spontaneity. In other cases, such as those of the Primitive Church, or the modern séance room, there exists, on the contrary, a deliberate attempt to exhaust the possibilities of the semi-dream state. St. Paul, in I. *Corinthians*, 14, gives a full account of such organised provocations. He communicates to his brethren the rules which should guide their assemblies. "If therefore the whole church be come together into some place, and all speak with tongues, and there come in those that are unlearned, or unbelievers, will they not say that ye are mad?" "How is it then, brethren? When ye come together, every one of you hath a psalm, hath a doctrine, hath a tongue, hath a revelation, hath an interpretation. Let all things be done unto edifying. If any man speak in an unknown tongue, let it be by two, or at the most by three, and that in turn; and let one interpret." "If anything be revealed to another that sitteth by, let the first hold his peace." St. Paul thus attempts to introduce order into these meetings where, owing to a strange conception of its importance, a peculiar condition is encouraged, a condition in which fancies are regarded as objective truths.

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[*] Sully (Article "Dream," *Enc. Brit.*, 1877) misapprehends the very nature of dream-life in his definition: "Dreams are a variety of a large class of mental phenomena which may be roughly defined as states of mind which, though not the result of the action of external objects, resume the form of objective perceptions" (p. 452).

[†] The physical condition of the dreamer I leave undetermined.

In sec. 220 we saw that persistent inattention necessarily leads to sleep. There are at least three methods of attaining this result. (1) We fix our attention on one thing exclusively: we stare at a brass button, we think of the object of our worship, or any other person or thing, and shut out every other thought; we look at a piece of glass, at our nose, or at any other physical point. Each of these attempts will, of necessity, be followed by a suspension of thought and action, as explained in sec. 220. The second and third methods accomplish their aim by the opposite course. (2) We fix no subject or object: but we head back the current of thought, or (3) we induce a state of rest by eschewing all effort. In these cases, thinking at last ceases. Then comes a fresh metamorphosis. When the object is not connected with anything of interest, and also when the experiment has been performed by oneself on oneself with no ulterior object of exploiting the state, we simply fall asleep. But let it be, however, imagined that some one else or something else, by some peculiar power, is producing the condition. As soon as thought has apparently fled, the supposed subject is roused to a semi-dream state, and the experimenter, imaginary or real, takes full control of the other's imagination. The "agent" represents the afferent stimulus, and supplies the "subject" with the dream-thoughts. Helpless as we are in the dream-state, it stands to reason that the "agent" will have almost unlimited power, and this he can employ in at least two ways. He can suggest any and every fanciful object or event: the young girl becomes a sea-captain; the young man an old lady; while actions and localities are arbitrarily selected and dwelt upon. Or the "agent," seriously, or in fun, impresses on the dreamer a series of beliefs. Then the "subject" becomes a devout Catholic, Buddhist, Mahommedan, Spiritualist, Theosophist, or what not. Since the notions have their origin within the imagination, there is no limit to their variety.

Training, as we should expect, plays an important part. The more frequently a person is thrown into the provoked dream-state, the oftener notions are insisted upon, the more ingenious the "agent" and the more fit the "subject," the more remarkable is the result. Yet the height of success is most conveniently reached when the individual experimented upon believes, whilst fully awake, that it is some outside power which takes possession of him. In such a case not only is his thought readily guided; but he becomes perhaps his own "agent." The notions he has imbibed during the waking state, whatever they be, assume supreme rule so soon as he falls asleep, and here also practice, combined with fitness, yields the highest returns. In this way the dream-state, being now subject to afferent, efferent and central influences, naturally approaches nearer and nearer the coherency of the waking state. It is impossible that it should be otherwise. At the same time we expect no high level of thought. To reach that there must be an elaborate examination of primary and secondary facts, and this can only be accomplished in the normal waking state, since great effort is absent in the dream-state. Accordingly, we find no record of any sustained original thinking being accomplished in the semi-dream condition. Assertion and repetition, wrapped in the cloak of rhetoric, are the twin children of provoked dreams.

Let us go a little more into detail. We attend a "circle" for the purpose of studying the machinery of provocation. A certain qualified investigator, after several attempts, goes successfully to sleep. As soon as this is observed some one approaches him quietly, takes his hand, and says, "Good evening, dear spirit friend, how are you? Won't you speak to us?" On the first few occasions there is perhaps no response. Gradually an impression is made, and the sleepy face lights up: the "medium" keeps on "developing." At first it may be he speaks only in unknown tongues, *i.e.*, utters a string of meaningless syllables which, according to the intelligence of the sitters, is explained as being African, Japanese, etc., or recognised as mere nonsense. However, the efforts are not relaxed. Steady pressure is brought to bear, and formative influences are allowed full sway until the "subject" has attained to the level of sober speech. He is then made to pray, to sing, to bring messages, to preach, to utter warnings or to prophesy. He becomes proficient in these by the prosaic methods of training, though they are not acknowledged as such. The contents of his imaginings are, of course, entirely subjective. In a good laboratory, or "developing circle," we see a number of persons with varying capacities in various stages of development, and the methods applied, when successful, are uniformly those which an efficient drill-sergeant would recommend. In these circles we find waves of excitement which occasion half a dozen or more to speak in "unknown tongues." We hear some one moaning (because his head is in an awkward position), and forthwith one "subject" after another rises and communicates sad tales to those present. It is superfluous to add that close-eyed and open-eyed visions reach their climax in these training establishments. Fancy after fancy is thrown on the eye-lid screen or on the canvas of reality.

Thus far the mass of spiritist accounts prove easy of explanation. Those, in St. Paul's churches, who talked in unknown tongues, sang psalms, prophesied or preached, offer no difficulties. Given the then existing beliefs, coupled with ignorance of all unusual thought processes, and the intellectual drift is plain. Yet in some instances more is claimed. The "possessed" person undertakes to tell us, among other things, (1) who we are, (2) what the future has in store, (3) what is happening in remote places, and (4) he assumes other personalities.

My observations suggest that the first question is answered, as we answer it in normal life. Your age, your garments, your behaviour, your speech, your expressions, are seized upon as points of departure. The prophecies are alternately bold and vague, and the utterances and manners of the person experimented upon are duly scheduled. If it be wrongly suggested that you are ill, and you reply to that effect, you are informed that you *have been* unwell. If you still demur, you are told that some one nearly related to you is ill, or has been ill; and, finally, you are warned that the illness lies in the near future, but that you may possibly circumvent it by extreme care. These ridiculous alternatives are the stock-in-trade of the "prophets."[*] There are, of course, other methods: for instance, the "agent" cautiously feels his way; or he describes near relatives in terms of yourself;[†] or he contents himself with vague generalities. The ingenuity displayed by the profession, paid or unpaid, is too varied to be exhaustively described. Self-deception fights desperately for the mastery with semi-deliberate and deliberate fraud. Given, therefore, a fair "sitter," a good medium will spell out correctly almost any name thought of. He will gather from the sitter's attention to the letters, and from his almost irrepressible excitement which are the letters he is expected to choose. I have neither seen nor heard, so far, of a medium who reads us as we read a book.

I once went to a medium armed with a number of immediately verifiable test questions. I was, however, told that it was one of the peculiarities of mediumship that the revelations came spontaneously and could not be produced by set questions—an excellent method this for tricksters. One interesting point is that mediums give names, dates and details which are incorrect, a result of second sight which demands an explanation. Answers to mental questions were with three mediums—West End mediums—produced in a purely mechanical manner. In every case without exception, to satisfy their many anxious customers, the answer was Yes, in combination occasionally with a few qualifying words. The results of such a method are often amusing. At one séance where the medium answered written questions, I asked "May I hope?" meaning "May I hope to succeed in proving that Spiritualism is a fraud?" The answer was "Yes; and you will not hope in vain." Later on, I put a mental question "Am I right in my interpretation of your answer?" and the inevitable reply came again "Yes." The crying shame is that these meetings usually commence with hymns and prayers, and make a mockery of grief.

[*] Dr. Hodgson's *A Further Record of Certain Phenomena of Trance*, 1898, dealing with a "medium," Mrs. Piper, well brings out these questionable points.

[†] In one case this was done systematically, and with almost every one. At a private séance with that same medium, he described to me both a gentleman and a lady by reading off my features one by one, only adding that the people referred to were white-haired, old, and the like.

The same explanation applies to the second and third claims.

With regard to the change of identity, when the dreamer is only inspired or uplifted, his own voice, thought and behaviour are naturally little affected. When, on the contrary, some other being of a definite type "controls" him, we look for differences of character. A good personator is, however, rare, and the results are, therefore, unedifying. It is the rule to have for one's "control" a little boy or girl, a black man, an Irishman, a foreigner, or a very distinguished person, because in these cases imitation imposes the least possible strain. Nevertheless, when tested, the personation fails *even here* at every point with the large mass of those who are supposed to be "controlled." Usually a trick or two, easily recognisable, embraces the whole difference between the normal and the quasi-abnormal medium. Those who believe themselves changed into wolves, and the whole tribe of the transformed, from the earliest dawn of ignorance to the modern séance room and hypnotic laboratory, are, as we now see, invariably victims of delusions. The semi-dream state permits any conceit, however preposterous, to arise and develop.

Such and of such a type are provoked dreams. I have attended séances in most parts of London, and my observations have been of a uniform character. What happened was in each instance exactly what was to be expected from my investigations of the vagaries of the semi-dream condition (sec. 223). I have heard dozens of mediums, and have spoken with scores of spiritualists; but I have not been able to discover any new facts. Especially have I taken for my guidance the views of "sitters." When persons have been spiritualists for twenty years and more; have "sat" in many circles in various parts of the country, and they look upon a séance as good, the inquirer need not go far to discover what Spiritism normally means. All those, again, who were converts, had stories to tell which argued for exactly the same principles. And lastly, the whole history of Spiritism among the different nations and races which have flourished, leads us to the same conclusions.

If that be so, how are we to account for members of learned societies seriously maintaining the objectivity of these pretences? The less said on the subject, the better. These scholars' names lure unwary souls into the net of superstition, as the names of highly-respected lords and dukes help to keep afloat spurious companies. They throw, by means of a just repute gained in other directions, a halo over the carcass of a superstition. The guilt is upon those men's heads; and not upon the simpleton who quotes their authority. If their scientific standing depended on the quality of their spiritist researches, they would hold no recognised position at all.

There is no science of Spiritism and there are no works on the subject. In the genuine sciences there is steady progress, whilst the most general conclusions are elaborated with the utmost diffidence. In the so-called science of Spiritism, it is different. A few hasty experiments settle the fundamental principles once for all. There is no continuity or system in Spiritist research. The whole mesh of scientific conclusions is cast aside with less ado than is made in tracing a particular nervous tract in the spinal cord. Then, after the short experimental stage, comes undiluted dogma and reckless speculation. Professors Wallace, Crookes, Lodge, and James illustrate what I am saying. Only the last of these is a psychologist, and he has never written anything bulky on the subject.

One long series of spiritualistic phenomena are explicable in a simple manner. If, for instance, we attach a piece of metal to a string about eighteen inches long which we hold in our hand, and desire it to move in one direction or another, either slow or fast, our desire is fulfilled. That is to say, when intently thinking of, or being about to undertake an action, we make minimal efforts to compass it. Very close observation of activity in general bears this out. I also notice that with eyes averted, the string experiment fails. Consistently with this I have not yet observed any one who, in thought reading games, simulates indifference successfully. Hence the thought reader's triumphs. Similarly, anxiety always betrays the victim at "table rapping." The medium offers, for instance, to have our name spelt out, and each time the appropriate letter is nearing, our restlessness betrays us. In the same way, we move the table and the planchette semi-consciously. There is a limit to these deceptive effects. James (*Psychology*, 1890, ii, p. 160) clearly recognises the result of minimal attention. "The whole surface of the body is always in a state of semi-conscious irritation which needs only the emphasis of attention, or of some accident of inward irritation, to become strong at any point."

Fraud is, of course, rampant in the spiritualistic camp. Having frequently read in high quarters of Mrs X. and Miss X., as supplying "physical manifestations," I went to "sit" with them. The objects of interest in the room were a musical box, a banjo, a tambourine, a bell, and a horn, all slightly touched with phosphorus so as to be luminous when the light was withdrawn. Then the room was made totally dark. On a sofa opposite, about two feet away from us, lay the instruments. On either side of me sat one of the mediums, each of my hands resting on the hands of one medium. Then, the instruments being placed one at a time on the floor, they moved and rose about a foot high, and there were attempts at music. During about fifty minutes, in unrelieved darkness, these "manifestations" were continued. Carefully reflecting over what had happened, I came to the conclusion that everything done betokened awkwardness and limitations though I did not understand the method of performance. After a few days I sat again with Mrs and Miss X. I asked Mrs X. whether she and her daughter would sit in a certain way, so that I might have appreciable control over their movements. This was agreed to. We sat for one hour and three quarters. For perhaps three quarters of an hour, to begin with, nothing happened, and during the remainder of the time about one fifth of what took place on the previous occasion was re-enacted. Besides, every movement of the objects was indicated as to its extent, degree and repetition, by the movements of Miss X.'s skirt which were hampered by the position in which I sat. Accordingly, I could invariably tell by the skirt moving when anything was *going to* "manifest" itself. Other circumstances, which need not be detailed, pointed clearly to the conclusion that the "manifestations" were fraudulent, and deliberately so. It was interesting to notice that these so-called miracle workers were even more anxious, for good reasons, to hold my hands than I was to hold theirs.

Mediums in general form a marked type. They are ostentatiously brusque, simple-minded and voluble. Most of those I have met were ignorant, unbeautiful in character and void of idealism. And yet persons of such a confidence-trick type are to demonstrate new and important truths!

There are no works on Spiritualism. Wallace (*Miracles and Modern Spiritualism*, 1896) offers a descriptive sketch by a strong partisan, with no attempt at scientific handling. Crookes (*Researches in the Phenomena of Spiritualism*, 1874) has a few interesting experiments. Podmore (*Studies in Psychical Research*, 1897) reviews the subject from a non-experimental standpoint. Besides these studies there are the *Proceedings of the Society for Psychical Research*, from 1883 to the present, which contain some reports, among others, by Lodge, as well as the "Report on the Census of Hallucinations," in vol. 10, and Hodgson's "Further Record," already referred to. Among non-spiritualistic interpretations we have Bradley, *Evidences of Spiritualism*, 1885, G. S[tanley] H[all], *Review of the Work of the Society for Psychical Research*, 1887 and 1895; Hansen and Lehmann, *Ueber unwillkurliches Flustern*, 1895; Hodgson, *Mr. Davey's Imitations by Conjuring*, 1892; Jastrow, *Fact and Fable in Psychology*, 1900; Newbold, *Experimental Induction of Automatic Processes*, 1895; Preyer, *Die Erklarung des Gedankenlesens*, 1886; Solomons and Stein, *Normal Motor Automatism*, 1896; Solomons *Automatic Reactions*, 1899; the present author, *The Case against Telepathy*, 1898-9; Stein, *Cultivated Motor Automatism*, 1898; Wundt, *Der Spiritismus eine sogenannte wissenschaftliche Frage*, 1879. The whole subject requires thorough examination by competent persons. The mediumistic phenomena should be reproduced experimentally by scholars, and their basis in each case determined. Observation of any kind, of self or others, apart from experiment, should be discouraged. Particularly must the investigator be careful to apply rules such as those referred to in sec. 136.

233.—ANIMAL PSYCHOLOGY.

Human activities are determined by human needs, while the animal's life is circumscribed by animal needs. Hence, since the needs differ in the two cases, the constitutions must differ also. We are consequently unable to learn deductively the precise behaviour of an unknown living being which possesses a central nervous system. Unfortunately I have made no elaborate study of the total psychic life of any animal. My nearest approach to such an undertaking has been to watch a few times for several hours together three orang-outangs—successive tenants—at the Zoological Gardens in London. Had I been able to repeat my visits daily for several weeks together, it is probable that I should be able to make some authoritative statement. As the matter stands, however, a few words must suffice. The apes were generally occupied in action or observation, the facts of attention applying to them in every way. The movements of their eyes closely resembled—even in rate of motion—those of the human family. Now the apes seemed curious, now interested, now fascinated, now agitated. Now their eyes rested on an object; now they took a comprehensive view; now there were expressions indicating hesitancy, doubt, familiarity, surprise, and alarm; now the eyes returned again and again to an object. On many occasions, too, their behaviour suggested that they were puzzled and were seeking for a solution. The first of the apes, the most active of the three, especially showed signs of thought. He would quietly gaze round his capacious cage, his eyes furtively resting on various objects; then they would slowly alight on something, and he would move in that direction. Frequently he appeared to look for some special article. Once while swinging on a trapeze, he came in collision with the partition. He then calmly turned round and looked at the particular spot. He never appeared to be in a hurry. He seemed to observe, and quietly solve difficulties. His whole manner was strangely reflective and human; and unlike that of a dog or a cat. If I held out my hand, the second orang-outang would look round, in an even more lazy fashion, for a suitable piece of straw, pick it up, and give it me. When I kept my hand open, he would try in various ways to place the straw so that I should retain it, this fact arguing decidedly for consistent thought. The third orang-outang would, in taking a basket into a higher branch of his tree, overcome difficulties in a variety of ways: he would hold the basket in one hand, then in one foot, then between his teeth, and then place it on his head. We are, therefore, justified in stating that at least one species beside the human possesses intelligent thought determined by a continuous and equal current of neural energy, as described in ch. 2. [*Students would do well to examine minutely and repeatedly an ape's life in the light of the conclusions arrived at in the second chapter, with note book in hand, of course.*]

Examples in illustration or refutation of ch. 3 should be collected by the zealous inquirer.

Since needs stimulate the ape to activity, it follows that his reactions are need-determined. What has been said thus far makes elaboration of the point superfluous.

The ape re-develops as well as pre-develops. He well knows his keeper and the objects of his environment. He returns to a place whence he has been driven by his companion.* The ape's thought possesses momentum, falls under the law of excitement, and obeys the rules of re-development which flow from the nature of the attention process. We have seen that re-development at intervals is imperative if the past is not to be wiped out. We know also that some animals identify their masters and other objects after considerable intervals of time. Either, then, the animal has occasionally visual or other images of things which are absent, or its memory is much more tenacious than ours. The question should be determined both by observation and experiment. It would be strange that neural excitement and momentum, as when a dog is in search of his master, or a parrot screams when hearing a friend approach, should be actualities, and that the animal nevertheless should neither re-develop nor imagine anything.†

Memory, as we know, has various aspects. In smelling a rose, for instance, we may recognise the scent as being that of a rose, although we cannot deliberately re-develop the scent, or the scent may be re-developed without recognising it for what it is. Again, re-development of the scent may be dependent on seeing the rose, while the re-developed scent may be able to suggest actions and not ideas. That is to say, *we must allow for primary and secondary recognition; ability to re-develop at all;* and *association with and without the presence of a primary or perceptual factor.*

Thought, in the strict sense, is merely a form of the process of satisfying a need (sec. 106). A dull person often learns nothing by doing: he inanely acts as he acted before; or if we assume a somewhat more intelligent individual, we shall find that he learns very slowly, or, lastly, a person may see the appropriate course of action at once. Furthermore, discrimination may be so highly developed, that sweeping generalisations are the rule, *e.g.*, the monkey who has learned by trial and error to walk round a certain object which is in the way of something he wants, may, after one success, not only repeat the successful process, but apply what he has learnt to every obstacle whatever. We might thus imagine a race of beings who have no *trains* of thought and who never reflect, and who yet attain to far-reaching conclusions with ease; what men have to discover in a groping way, they can see at once. With human beings thought, roughly speaking, consists normally of *trains* of thought, but thought which consists only of one step is not infrequent.

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* A sparrow will thus take to flight, and return when the danger is over. So a dog looked up to a window where he had noticed me a moment before.

† "The possibility is that animals may have *no images or memories at all, no ideas to associate*" (Thorndike, *Animal Intelligence*, 1898, p. 73).

The existence of *trains* of thought in animals would not, therefore, decide anything as regards their intelligence, since long trains of thought may not be as effectual in the solution of a difficulty as spontaneous insight. For this reason the distinction between perceptual, ideational and conceptual process (Stout, *Manual*, 1898-9), is more important theoretically than practically, and that because the distinctions do not mark corresponding degrees of intelligence. Nevertheless the problem still remains to be decided whether trains of thought of any length or coherency are to be found outside the human species. The evidence, so far, discourages the belief. Indeed, an intelligent child of twenty months whom I observed closely, and who scarcely knew any words, showed no signs of other than perceptual thought.

All that has been stated in ch. 6 as to neural disturbances, neural inclinations, emotions, and need-determined thoughts, holds good of animals.

The ape is impelled by organic needs. Since these differ from ours, it is idle to measure his intelligence by the criterion of actions which only arise out of human needs. For the same reason, the development of his thought has a complexion different from our own. In experiments, therefore, we should sympathetically enter into the ape's or other animal's nature, and set him ever higher tasks which fall within his purview. We must aim at an ideal ape, and not at a caricature of a man.

The ape's thoughts are neurally determined. The sensory series with him is not parallel with the neural series, nor do feelings give birth to each other or affect the brain.

Most of our thought is communicated to us. *If we cut ourselves off from others, we bid adieu to every vestige of culture, and we become houseless, clothesless, languageless, bookless, art-less and science-less animals.* The ape is in this position; and hence we must expect nothing deep or far-reaching from him. A cultured man is fed by the many rivers which hurry down the mountains of time, while an ape has to rely on his mother-wit solely. Probably "culture" is not among his needs, and hence he holds it in contempt. In experiments we must allow for the fact that our wit is borrowed, that our training has occupied many years, and that consequently it is unreasonable to expect that an undeveloped ape should react as intelligently as a matured man.

The ape's thought is sometimes more deliberate than at other times. His reactions are also frequently attention-determined.

A general survey of the preceding remarks can leave us in no doubt that the agreements between human and animal thought immeasurably outnumber the differences. These latter are entirely accounted for by the distinctive needs and the consequent absence of historically gathered knowledge. Man does not shine by his ability, but by *his native capacity of development and his social impressibility.* Rob him of these attributes and the one point of difference between man and animal is abolished. Psychologically, therefore, we decide that the various capabilities of the higher animals, including man, differ only in trifling details.* [*Observe, and experiment with domesticated animals, carefully avoiding any unkindness.*]

Nearly all the observations hitherto made on animals are usually interpreted in the light of the current speculative psychology. Prof. Calderwood (*Mind and Brain*, 1892) and others tell us that animals achieve successes, not by using reason, but by instinct and by their highly developed senses. Yet, strange to say, writers like Sully assure us that one of the conditions of genius is special congenital susceptibility in a certain direction, thus bringing canine intelligence and human genius into dangerous proximity. The fact is that instinct and inherited aptitude play a serious part in human development, and that without these we should not be human beings at all. The ceaseless limb, eye and voice movements of the infant, and the consequent development along the lines of play and curiosity, of love and of adventure, are as much hereditary tendencies as the sniffing of a dog or the piping of a chicken. The dog has certainly a somewhat different line of development; but that has nothing to do with fundamentals. The great fact which we have to admit is that apart from inherited aptitudes which may be capable of more or less expansion, human activity is as little intelligible as ape activity.

However, we are referred to the proverbial incapacity of an animal to infer and reason. To drive that point home, we are assured that the wonderful feats of animals of which we hear so much, are merely acquired tricks, void of the higher qualities. Thus, for instance, Thorndike (*Animal Intelligence*, 1898), with the aid of a long series of ingenious experiments, endeavours to show that cats only come to open doors by chance, and not by an effort of intellect, as men are supposed to do. For my part I believe that the facts have been misinterpreted. Let me give some instances. A kitten which I know, knows me well. The moment she hears my footsteps, she runs to meet me. When she sees me, she almost shrieks with apparent pleasure. If I stop still, she lies down and rolls over my feet in scores of different ways, eagerly looking up for encouragement. When, again, food is thrown down as she rests on a chair, and she is not very hungry, she will look down and look away, then look again, and so on. Then she bends down and again straightens herself. Then she lets herself almost down; but once more looks indifferent. Yet when removed from the chair, she will readily find and eat the food. Take another case. I am in a room with the door closed, and on the sofa lies a cat which is a stranger to me, though not to the house. Suddenly footsteps are heard; apparently also something is scented, and the cat runs to the door. Mark what happens. She does not inanely scratch. She tries deliberately the lower corner of the door where it opens, but without success. She then walks along the door and looks at its edges. Then she looks up and at the lock. Then she touches something that is hanging from a nail on the door, which object moves without the desired result. Then she touches the object again, but quite gently, as who would say "It's no use." At last, she turns round, walks up to me, though a stranger, looks at me, and miaws pitifully. Here surely is a picture utterly different from that drawn by Thorndike.†

To multiply examples would be tedious. Such cases bear witness to deliberate and complicated activity. To say that these cats do not doubt, hesitate, discriminate, judge, infer, learn, compare, re-develop, is surely to play with words. It is to deny the substance, because the shadow—the speech—is absent. Nevertheless men insist, and rightly, that when animals are taught anything, they learn it by mere chance repetition. What else can we expect? A human being can only proceed from the known to the unknown, and how then is the cat to *jump* to a conclusion? Thorndike mentions that when slight differences were made, the cats readily appreciated these. He says in effect: "Previous experience makes a difference in the quickness with which the cat forms associations. . . Its tendency to pay attention to what it is doing gets strengthened" (*ibid*, p. 28). Would it not be right, then, to say that only by graduated training, as with a human being, should an animal be tested?

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* I must touch here on a singular psychological tradition. One prominent writer after another has said that a chicken will, *immediately* on emerging from the shell, successfully run and peck. Poultry keepers smiled when I questioned them as to the truth of the tradition, and repeated observation showed no trace of successful running and pecking with chickens just hatched. I am, therefore, glad to quote an authority on this point. "On leaving the shell they [the chickens] are wet and helpless; they struggle with their legs, wings, and necks, but are unable to stand or hold up their heads. Soon, however, they may be distinctly seen and felt pressing against and endeavouring to keep in contact with any warm object. They advance very rapidly. I have seen them hold up their heads well, peck at objects, and attempt to dress their wings when only but four or five hours old" (Spalding, *Instinct*, 1873, p. 283).

† The oldest of his cats was 19 months old (*ibid*, p. 13), and he expects these to act like university graduates.

It will, however, be replied that human beings reason out a case, and that they are not dependent on learning every step. In this lies the fundamental fallacy, the assumption that man proceeds differently from the cat, and in this Thorndike's human psychology is hopelessly mythical, for, throughout his essay, thought means for him employing a great number of words, while he implies that the humble kitten should, without training, be a latter-day philosopher. According to the teachings of this work, the child's intelligence grows very gradually: more and more complications or associations are acquired; cumbersome associations are slowly formed; methods by which to answer nearly every general question are assimilated,—until, after twenty years spent in studiously absorbing the facts and the methods of his fellows, the man begins to philosophise. Yet this philosophising is merely a further elaboration similar to the simplest kind of membering. It suggests no new process; for if it did, then man would be ever changing into some different class of being. All that we have in a long train of verbal reasoning as distinguished from a simple act is greater complexity; otherwise system after system follows as promptly, and for the same reason, as in the chicken or the dog. Hence when Thorndike says of the actions of animals that "they represent the wearing smooth of a path in the brain, not the decisions of a rational consciousness" (*ibid*, p. 45), he draws a distinction without a difference. This has been so abundantly shown, especially in ch. 4, that no more need be added. (See also Hobhouse, *Mind in Evolution*, 1901.)

The real differences between animals lie deeper. The dog has not, and man has, an inherited aptitude to learn and to continue learning; and the dog has little, and man much, use for complicated combinations to satisfy his needs. Hence all that should be attempted in training animals, is to make them patterns of their own species.

234.—A BIRD'S EYE VIEW.

Considered from a theoretical point of view the satisfaction of a need might never meet with obstacles; or when obstacles did occur, there might be no attempt to overcome them. In practice, however, we find that obstacles do occur, and that strenuous attempts to surmount them are not infrequent. Yet, under differing conditions, the magnitude of those attempts varies: in the full waking state, the trained thinker, when he is in earnest, is scarcely daunted by any obstacle; under ordinary circumstances he only deliberates, and hence there is a drop in the value of his reflection; when he is roaming in thought, obstacles are not overcome, but avoided; and in dream-life, through changed conditions where the muscular and sensory tone are lowered, primary and secondary systems, the imagination and the judgment develop most imperfectly. The quality of our reactions is, therefore, determined by the strenuousness of our endeavours; and since such strenuousness can only be passingly exerted, there is a tendency for the quality of our thought to be of a low degree, and this especially in idle moments, in a poor state of health, when the attention has not been trained, and in dream-life whether provoked or not. Lastly, we discussed the nature of the animal mind.

CHAPTER XI

SYSTEMS AS ATTENTION-DETERMINED

'Tis attention-needs explain
Humour, play, and beauty's reign.

235.—GENERAL.

THE stream of attention is normally a constant in the waking state (see 22). Hence arise a multiplicity of problems, all bearing on the question of how to preserve a normal flow. With many of these aspects I have already dealt at length; but in this chapter I wish to treat of one more. We have seen how reluctantly the attention is concentrated, and how prostrate we become under sustained effort. Evidently, then, the highest satisfaction will be obtained when there is something which genially occupies the attention without demanding special muscular exertion or fatiguing reflections.

At the same time the organic view of thought which we have adopted in this work implies that even in what is called self-determined activity there is a satisfaction of needs, only the needs are prosecuted no farther than they satisfy the attention mechanism. Accordingly every class of æsthetic activity is but the playful pursuit of what otherwise is a serious concern. We may say that *æsthetic gratification exists when needs are satisfied only in so far as they are agreeable to the attention mechanism.*

236.—THE BEAUTIFUL IN VISUAL FORMS.

Taking, therefore, the case of visual forms, we assert that *that is beautiful the contemplation* * *of which, of itself, occupies the attention.* [*Test this definition in every possible way.*] In examining the various parts of this definition we shall ascertain the facts which it embodies.

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* "Perhaps the first and most striking peculiarity of æsthetic enjoyment is to be found in its contemplative character" (Sully, *Human Mind*, 1892, ii, p. 135). By contemplation is presumably meant the spontaneous and non-interested satisfaction of *curiosity.* There seems reason to think that *all æsthetic activities are rudiments of some useful function*, and that thus *the beautiful represents rudimentary curiosity as humour represents rudimentary malice and as imagination and play represent rudimentary thought and action.* Hence æsthetics are not unconnected with normal life and development. (Sec. 248.)

The first point that strikes us is that playful or self-determined reactions essentially depend on the bee-like nature of the attention process, and that apart from this aspect, it is conceivable that the nature of nervous functioning should be in exact correspondence with existing needs. On this hypothesis, whenever these needs asserted themselves, the locomotive of thought would begin its journey, continuing until the needs were satisfied, or till interest flagged. In such an event, self-determined combinations would be out of the question. They would serve no purpose, and have no place in the human economy; there would be nothing to set them going, to control them, or to stop them. It is, however, a different matter when we have to deal with the nervous organism, as we know it. The functional tendencies are present, and their actualisation has important consequences. Physical and neural strain, successful as they are, to a certain degree, in strengthening and developing functions, are nevertheless not normal to our nature. We require a stimulus to encourage us in tiring labour. We recoil from oakum picking or the treadmill, nothing urging us to that kind of occupation. On the other hand, when we seek relief from strenuous endeavour, we are not fully satisfied with wandering thought. The contents, in the latter case, are often unattractive. We are restless because we have to think continually of fresh topics, and because the effort of random thought lacks the desirable degree of strenuousness. What is demanded, under such conditions, is a means of easily passing our time, with just the dash of effort * to keep the organism sweet. The contemplation of certain forms satisfies this want to perfection, and hence the conception of the beautiful is to us, human beings, inconceivable apart from an organic structure such as our body presents us with. [*Try to disprove this.*] "No body, no beauty," or, at all events, we do not know how to connect the notion of the beautiful with anything but the attention mechanism.

From the definition we have rigidly excluded objects which occupy the attention, but which have a derived interest. [*Note this distinction.*] When I am dining it is not the contemplation of the nourishment, for its own sake, which attracts me. Behind it lurks the demon hunger. The infant eagerly seeks his food when famished; but when he is satisfied he takes no more notice of it. Thus a person who is struck with horror, is not moved by the white patch before him, but by the fear of certain consequences, and once assured that the ghost is only a white sheet, due allowance being made for the subsidence of his excitement, he looks at it calmly and ceases to concern himself with it. So also a huge poster, a monster hoarding or the soaring pyramids of Egypt do not attract us in themselves. They do so because of their contrast with those posters, hoardings and pyramids which are pigmies by comparison. Their fascination has its origin, therefore, in their "relative" size. [*Test this.*] Only when contemplation has no before or after, do we speak of it as having regard to the beautiful. In accordance with this, we miss the beautiful when we are engaged in learning the outlines and colours of an object. A person occupied in this way displays no appreciation, as commonly understood. Again, one who contemplates objects because of an extraneous reward, or because of the fear of punishment, is to that extent a stranger to art.

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* The necessity for employing measurable effort in the contemplation of the beautiful is recognised by Dumont, who says: "The beautiful is that which presents a great complication in the unity of one conception, in such wise that the realisation of the conception in the imagination, demands a considerable outlay of force" (*La Sensibilité*, 1875, p. 174).

"It has been the custom, from the time of Plato, to sharply mark off the beautiful from the useful" (Sully, *Human Mind*, 1892, ii, p. 134). So Kant, *Kritik der Urtheilskraft*, 1790: "Every one must admit that an æsthetic judgment in which interest plays ever so small a part is partial and illegitimate. To be a judge in matters of taste, the existence of the thing to be judged must be indifferent to us." So Spencer, *Psychology*, 1890, ii, p. 635: "In the conception of a thing, as fine, as admirable, as beautiful, as grand, consciousness is not occupied, distinctly or vaguely, with ultimate advantage, but is occupied with the thing itself as a direct source of pleasure."[*]

As to the place of pleasure in æsthetics, Sully speaks of "art in its relation to what Englishmen at least in the main are agreed to regard as its end, pleasurable emotion" (in *Mind*, 1893, p. 117). So Fechner, *Vorschule der Æsthetik*, 1876, i: "Everything which has the property of pleasing directly, independently of reflection and teleological considerations, is, in the widest sense, called beautiful, especially if the property be pronounced and pure" (p. 15), and "Æsthetics, according to our view, relate to pleasure and pain, in so far as pleasure and pain directly depend on ideas and sensations awakened from without" (p. 37). I, of course, reject the pleasure-pain theory in æsthetics.

The following are the marks of the sublime according to Burke, *The Sublime and the Beautiful*, Works, i, 1792: terror, obscurity, power, privation, vastness, infinity, succession and uniformity, and magnificence. The beautiful, according to the same author, is the exact opposite of the sublime, implying smallness, smoothness, gradual variation, delicacy, and like qualities. Hence his strange question, "Will any one call the elephant, the wolf and the lion beautiful animals?" (p 171).

We are well acquainted with the nature of the attention process. We have observed its waves and its ripples (ch. 2). We know that it impatiently presses onward like a torrent, and that it violently resents interference. The nature of the beautiful, therefore, is defined by the nature of the attention process. It cannot consist in a single act, for that would only lead to a senseless stare. The only way in which an object can occupy the attention is by displaying, in turn, a variety of features. Accordingly we learn that an ideally simple object, one that is which possesses the minimum of characteristics, can appeal only minimally to our sense of the beautiful. [*Contemplate a white sheet of paper.*] Variety, therefore, is one of the fundamentals in artistic contemplation, while lack of variety, other things being equal, tires the attention and leaves us unsatisfied. Yet a certain degree of strenuousness is equally necessary: there must be gentle effort if the attention is not to be restless. A heterogeneous assemblage does not appeal to us. The items must appear in a more or less close relation to one another; they must be welded into some sort of a system, not too easy to embrace at once. The object must be full of obstacles which are readily, though not too readily, overcome. There must be gentle exercise, with just a flush of effort*; and such exercise must be provoked by no considerations except those of occupying the attention satisfactorily. The ideally beautiful, therefore, will be that which most succeeds in holding the attention for the longest possible time; and the ugliest will be that which the attention most shuns because variety is missing or gentle exercise inapplicable. [*Apply simple case, negative case, opposite case, objective case, and cases of gradual extension and degree.*]

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[*] For a view identifying products of art as useful, see Hirn, *The Origins of Art*, 1900, and Collin, *Literature and Life*, 1900.

The contemplation of a sunset offers an admirable illustration. [*Test experimentally.*] We lean against a five-barred gate and feast our eyes on the magnificent spectacle which lies above us. We are lost in rapture and admiration. We gaze and gaze. Then, when the battle of colours is ended, we walk away, still dazed by the splendour we have witnessed. So absorbed have we been that we are scarcely aware now of what has passed. We did not deliberately reason, observe or admire anything. We melted into the scene. Our many senses were reduced to one, the sense of beauty. Our whole complex being shrunk, until this sense alone remained. Yet the sunset was by no means the first one we had witnessed. That five-barred gate, opening into a meadow full of sweet-scented cowslips, is quite familiar to us. Evening after evening we cross the little strip of oak wood which hides the west, and breathlessly we go out to the dioramic vision. The young rabbit sits close by us, his ears aglow, and the young mole joyously runs to and fro, oblivious of our presence. Cloaked in contemplation, we form part of the peaceful scene.

Why should we become ecstatic on account of a sunset? Why not choose a plain white sheet of paper for admiration? Is it anything but custom which decides that we shall rave about the one and pay no attention to the other? Our principles give an unmistakable reply to these queries. The sunset sky is an admirable object which sustains the attention [*is it?*], and for this reason. To occupy ourselves we require a quantity of details, and the sky is full of them. Range after range of clouds are scattered above us, all lavishly illuminated. The forms are of the most varied outlines. So manifold are the attractions that time scarcely permits us to dwell on minor shapes. The colours themselves show an abundance of minute variations. On the one hand they point to what would otherwise remain unnoticed, while on the other, their differences and their shading one into another, add largely to the material of our contemplation. It is chiefly for this reason that the grey clouds of day are so little appreciated until they approach the night. The grey is difficult to see; delicate outlines are overlooked; and in the distance the detail is blended into an undistinguishable mass. The day clouds, therefore, are much inferior from the point of view of beauty, growing uninteresting as they become duller, or as their detail becomes blurred.

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* "The highest beauty of visible objects is obtained by lustre. The metals and precious gems are recommended by it. The finer woods yield it by polish and varnish. The

painter's colours are naturally dead, and he superadds the transparent film. This property redeems the privation of colour, as in the lustrous black. The green leaf is often adorned by it, through the addition of moisture. Possibly, much of the refreshing influence of greenness in vegetation is due to lustrous greenness. Animal tissues present the effect in a high degree. Ivory, mother of pearl, bone, silk, and wool are of the class of brilliant or glittering substances. The human skin is a combination of richness of colouring with lustre. The hair is beautiful in a great measure from its brilliancy. The eye is perhaps the finest example: the deep black of the choroid, and the colours of the iris, are liquefied by the transparency of the humours" (Bain, *Senses and Intellect*, 1894, pp. 250-1). May we not say that lustre reveals and combines details, and that its æsthetic virtue lies in that?

The fascination has still another source. As we gaze on the sunset colours, they imperceptibly but continuously change, and with them the cloud shapes. If the changes were very slow, the attention would not be affected by them and would tend to become tired. [*Test experimentally.*] If the changes passed very rapidly, vision after vision would be guessed at without being fully integrated. [*Verify.*] The attention would be exasperated instead of being satisfied, and we should witness a strange and painful spectacle instead of a beautiful one. As if by an artifice, however, the colours, shades and shapes are usually transformed just quickly enough to prevent the attention being starved or overfed. The variety is sufficiently large to hold us permanently enthralled.

Yet heterogeneity does not satisfy the attention properly. Unrelated outlines require too large a number of small efforts or readjustments, and attention, even in art, must, therefore, be topical, having a subject, and subdivisions within it. This is obviously so, since contemplation of whatever type must obey the primary facts of the attention process. Hence the sky must be more to us than a vast aggregate. And so it is. The sun is the throne about which colours and shapes group themselves. The variations in the degrees and kinds of tints are based on one centrally determined scale, the view as a whole, and all its parts, belonging equally to one system of relations. The whole expanse, from the sinking orb to the opposite side in the east, shows one uniform plan of transformation. So, too, the changes are symbolic of one supreme event, the setting of the sun, while both the space and the time series are organically interwoven. We thus meet boundless multiplicity, never the same from minute to minute and from day to day; but all is ordered from one controlling centre.

In the text of this section I have attempted not merely to expound, but to explain, the well worn notion of unity in variety. Sully (*Human Mind*, 1892, ii, p. 139) says that the æsthetic value due to certain modes of grouping the sensuous elements "depends on . . . (a) variety, or (in its intenser degrees) contrast, and (b) harmony, or peaceful co-ordination of diverse elements." Baldwin (*Feeling and Will*, 1891, p. 233) observes that "the simplest empirical observation of beautiful things suffices to illustrate the necessity of both unity and variety in form in any object to which we attach this predicate." With this principle in view Fechner (*Vorschule*, 1876, i) remarks that "the finest work of art becomes tiresome if we contemplate it too long" (p. 59); and that we weary of twenty short stories, but readily read one long one (pp. 68-9). Bosanquet (*A History of Æsthetic*, 1892, pp. 4-5) alludes to the doctrine as historic.

"The loosest weed that drifts and waves under the heaving of the sea, or hangs heavily on the brown and slippery shore, has a marked strength, structure, elasticity, gradation of substance; its extremities are more finely fibred than its centre, its centre than its root: every fork of its ramification is measured and proportioned; every wave of its languid lines is lovely. It has its allotted size, and place, and function; it is a specific creature" (*Seven Lamps of Architecture*, 1897, p. 202). In this systematised variety within unity lies the beautiful. Ruskin, however, seems to have a different theory. First, he argues, "all most lovely forms and thoughts are directly taken from natural objects" (*ibid*, p. 190), and hence speaks of a riband, as "a vile thing" (*ibid*, p. 203), limiting in this way the realm of the beautiful; and, secondly, he contends "that, knowing a thing to be frequent, we may assume it to be beautiful; and assume that which is most frequent to be most beautiful: I mean, of course, *visibly* frequent" (*ibid*, p. 192). In my opinion neither naturalness nor visible frequency are essential marks of the beautiful. If a natural object is beautiful, it is because it bears those marks which I have referred to in the text. Hence many a natural object may be unattractive, while many an artificial product may charm us. Besides, is it so easy to show that a riband is not a natural object? As to the relation of frequency or familiarity to the beautiful, much might be said. The very fact that the attention does not deal easily with what is unfamiliar, shows that entire unfamiliarity prevents æsthetic developments; and so, too, our knowing little of a thing implies a lack of visible variety and an ignorance of organic unity, these being essential in the observation of the beautiful.* Hence we are bound to conclude that frequency may exist without any corresponding beauty, and that the satisfaction connected with what is familiar is not truly æsthetic. The factors in æsthetics probably are: (1) the implied sense material; (2) the fitness of that material to satisfy the attention mechanism; (3) the complications or associations into which the sensations are formed; and (4) the ease which comes through familiarity.

Our analysis is not yet complete. There are two non-æsthetic factors which contribute to our admiration and determine the part played by colours as such. [*Find other factors.*] The first is the magnificent sweep of the sky. Its *largeness* constitutes part of its *grand*eur. The size acts as a constant tonic, and, though not theoretically to be counted as a portion of æsthetic gratification, has, nevertheless, in practice considerable influence. It helps to emphasise the *ensemble*. From the standpoint of beauty, dimension is only of importance because it allows room for detail. The second factor is the series of surprises connected with the novelty of much that is developed. Our curiosity is attracted by new tints and new shapes. We have not seen this colour before, and that fantastic form challenges attention. In either instance, purposive contemplation combines with, or ousts, the purer form. However, these two factors act the rôle of supers, and are by no means the heroes of the celestial fantasia which we are admiring from the green-carpeted pit.

What is said here explains why a painted sunset cannot compete with a real one. At best, the picture will charm us because of subtle reminiscences of real sunsets; for fine as it may be, it lacks the detail which the magnificent and changing skies offer. Attention-energy soon exhausts, if only for the time being, what is presented for development. The neural calls on us are too great to allow us to look very long at a picture.

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* Note that the "safety bicycle" was once considered to be ugly, and the "ordinary" graceful, and that now the opposite opinion prevails.

Coming back fresh, it may give us joy repeatedly, and perhaps for all time we can linger over it for a moment; still, the machinery of the attention process is such that only comparative freshness challenges us. We see, therefore, that the beautiful has no arbitrary origin. Its roots branch down into the very depths of the soil of life. What regulates it, except for error, is a truth as lasting as our nervous structure itself.

Next to the glow of a sunset there is in nature perhaps nothing so beautiful as Spring, while variety, transmutation and system are attributes of the latter as of the former. The abounding snow-white blossoms of the blackthorn, standing out sharply defined from the dark branches, invite our gaze. The delicate rose-coloured blooms of the almond tree bid us welcome. The leaf-buds are swelling, the cramped leaves burst through, and gradually the bushes spread out their tiny sails. The hardy celandine flanks the moist places. The wood-anemone, graceful in outline and sprayed with soft white and red and blue, flies along the ground. The pale primrose belies its pallor by its numerous progeny and vigour. The wild hyacinth, most tender in colour and in form, sanctifies the ground it dwells on. The demure cowslip with its tiny throat, its precious necklace, its hanging head, and its sweet scent, calls us to the meadows. In this way, almost day by day, surprises are in store. The violet, the daisy, the daffodil, the buttercup and the whole array of elegant creatures, arrive in procession and greet us and give us cheer. Meanwhile our ears are not less pleased. The prolonged notes of the robin, the outbursts of the lark, the thrush's melodious litany, the blackbird's call, the cuckoo's riddle, the nightingale's sweet challenges, appear like echoes carried from mountain to mountain. The chorus swells, till the music of the spheres has become a reality. And now the earth's standing armies, the trees, put on their quaintly-cut emerald garments. Each tree looks as fresh as if it were the first of its kind: the pines with their trimmings, the beeches with their cymbals, the oaks with their golden patterns. Spring having arrived, we can no more peep through hedges, and no more pierce the wood with our sight. Green screens fence in the distance everywhere.

Spring time must be felt; it cannot be adequately described. Its burden, though its *tempo* be slower, is the same as that of the setting sun: an immense surface, boundless variety, constant transformation and organic interconnection. We walk across spacious meadows, along river banks, past flocks of sheep, through woods and lanes, and in this manner we have the best opportunity of watching Spring's procession. If we travelled too far—into various counties, for instance—we should miss that organic hold which familiarity with a neighbourhood yields. [*Is that so?*] At home we are stimulated, kept on the alert, without the danger of tiring ourselves with the effort to understand what is largely novel. Many delicate changes are overlooked abroad, and yet these, if observed, would occasion a series of delightful shocks. To roam aimlessly, given our nervous mechanism, largely reduces the pleasures of Spring. Indeed, townspeople who seldom make excursions into the country, and then each time to a different place, who know a nightingale by night and a lark when they see it poised, who are only sure about the cuckoo's call and tell a violet by its colour: to such Spring hardly conveys a meaning. For them there is too much to be observed, too little to be comprehended, to make the landscape what it is to the poet who dwells in the midst of the panorama of change. That is to say, away from what is homely, the attention is wearied and stupefied instead of being easily occupied and gently stimulated. On the other hand, if we observe Spring in a tiny garden alone, it equally forfeits its right to be one of the wonders of the world. The one or two bushes, the one or two trees, the few square feet of turf, and the occasional chaffinch or robin that chances to alight, beautiful as they are in their way, do not yield massive delights. There is no breathing space for the attention, no incessant change on a large scale, no coherent drama, to be observed. What is Spring time in a large town? It scarcely suggests the infinite enjoyments of the country. The houses are scarcely affected, the roads only a little muddier, the rosy buds turn dull, the leaves become dirty, the bark is uniformly coloured by the smoke, and as for larks and thrushes and nightingales, these, even if they came, would not be heard above the din of noise and the thick layers of dulled sound. Whichever way we posit our problem, our conclusions are still readily verified. The beautiful implies extensive variety and, therefore, a vast expanse. It identifies itself neither with what requires keen effort for appreciation nor with that which needs no effort. It unmistakably demands a gentle and sustained stimulus. It insists upon some kind of systematic arrangement. In the absence of order the attention wanders, for it cannot bear the strain involved in persistent readjustment. Spring, the inspirer of the poet and the select companion of the lover of nature, does not, then, owe its fame to fashion, custom, fancy or philosophy. It appeals to the eternal in us. It satisfies the attention mechanism, as food satisfies the digestive organs. Apart from an organism such as ours we have no conception of the beautiful.

We have analysed two examples designed to bring out in full the implications of the beautiful. We shall now descend to common facts. Look at the dust in the road on a summer's day, or the mud on a dull November afternoon. [*Test this.*] Why do we not admire them, as we do the sunset, the Spring, the sea or the stars? Plainly because they are powerless to convey much to us. The mud is a monotonous grey-brown, which prevents the emergence of recognisable outlines. [*Is this so?*] There are no considerable variations observable. There is little for the attention to dwell upon. There is no interdependence between the different particles, the grasping of which should stimulate the nervous system. There is no appreciable change going on to relieve the monotony. We can only rivet the attention by repeated efforts. Hence we do not contemplate the mud, nor look upon it as a beautiful object. Yet give the moonlight free play on a mud bank left bare by the receding tide, and, the conditions being altered, we are face to face with a brilliant exhibition. For this reason, all formless and uniform accumulations repel us, because they cannot hold the attention. The various aggregates produced by accident, such as the contents of a waste-paper basket, or the litter on a table, fall under this condemnation. The attention shoots off as it approaches them. In a moment it is satisfied; the next moment, it seeks fresh food. Seeming exceptions there are. Autumn's tinted leaves, as they garland-like border a lake, or snow-like cover the house-steps, are beautiful in spite of the absence of natural or artistic arrangements. The explanation is simple. The organic shadings in the single leaves constitute one attraction; another lies in the great variety produced by the immense assemblage of colour; and a third in the contrast between gay tints and decay. Pure heterogeneity repels, just as does pure homogeneity.

Let us look at definite shapes. [*Do so.*] Here is a triangle △, and here is a square □. May we regard them as possessing exquisite beauty? Shall we contemplate them rapturously? Clearly not. Though an organic connection exists there are few points, and the interdependence is so obvious that we detect it forthwith. Regular forms, such as a triangle, are pleasing; but the pleasure is evanescent, since it takes very little time to observe all that can be readily observed therein. Yet suppose that we look at a row of ten triangles, or even ten rows of a hundred of them, will these impose upon us? We are no doubt struck by the number; but we take no pleasure in the sight. In an instant we recognise the unity and the plan, and have done with it; we wonder, but hardly admire. Nothing lures us to prolonged contemplation. Of course, when angular forms are interconnected, and when they are represented in a design, then, the conditions being more favourable, we contemplate the result with more or less enjoyment. Accordingly, such patterns commend themselves to the simple taste. For ordinary purposes the momentary delight they give is all that is demanded.

The higher we aim, the less obvious do patterns become. At first, they are not elaborate; but later on, they are over-elaborated and come to be distasteful, since the attention shrinks from their complexity. At their best, a hidden order is sought by the artist, such as challenges the imagination without completely yielding up the secret. In such instances admiration knows practically no time limit. We take a perpetual delight in dwelling on the form, hunting for that which we feel to be there, but which ever eludes us. Those sets of outlines which seem to disclose, and yet do not disclose, their secret, are favourites of the attention. They are in direct contrast to the mechanical order observable in the paving stones of a street, or in primitive and monotonous wall papers. He who can produce forms which are easily but not completely grasped, has mounted more than one rung of the ladder of art. Curves are of this satisfactory and yet elusive type: they puzzle us and yet gratify us.

The best pictures are a good exemplification of our general contention. The presence of colours, their happy arrangement, the supple forms, the organic connection of the whole—all these contribute to the creation of the intended effect. A "wooden" figure is one lacking in systematic detail and boldness. [*Test.*] A perfect figure is one where much is seen, and more is suggested [*Test*], and for this reason the few strokes of the caricaturist have their secret not in the quantitative or qualitative merit of the outlines, but in what these hint at. In other words, the presence of pertinent detail is a test of beauty, and accordingly an apparently simple good picture embodies much labour: the work is there, but does not obtrude itself. The life-like effect in inferior paintings, on the other hand, depends on the line written underneath or on the general arrangement. [*Test.*] The faces tell nothing; they are dolls' faces. Covering up all but a face, we are at a loss whether it represents a boy or a girl, a man or a woman. The face of the lover, and the face of his beloved, equally lack expression. Fashion plates are also apt illustrations of this emptiness. Now, for a picture to tell us nothing, or to violate our notions of things, what is it but to lack organic detail and to repel the attention. If the uncultured classes admire bad pictures, it is on account of an obvious illusion of judgment. As a matter of fact, it is only for a very short time that they can study these cheap coloured prints, for, in themselves, they attract the ignorant man as little as the cultured. It is a good omen when copies of famous pictures figure in the households of the humble, and when advertisers prefer a homely face to the presentation of expressionless beauty.

The realm of the æsthetically indifferent, which has so large a place reserved to it in life's routine, finds, of course, its explanation in our principles. The grey pavement, the rows of brick houses lacking ornament, the dingy shops, owe their unattractiveness to the same source. Hence the difference between a room in a state of natural and one in a state of artistic confusion. Every object, in short, has its fixed æsthetic value, and, subject to what is said in the succeeding sections, yields the same gratification to all. *De gustibus non disputandum* only holds good when we confuse beauty with a number of things which have nothing to do with it, for as a strictly scientific assertion it is false. The middle ages might as well have argued that *de scientiis non disputandum*, because in those times science and error were boon-companions.

Kant (*Kritik der Urtheilskraft*, 1790, § 7) goes to the extreme by insisting that there can be no difference of opinion as to what is beautiful. His arguments are contradicted by the fact of æsthetic development, and by observation generally. If it is easier to differ concerning the agreeable than the beautiful, it is because the attention mechanism is far more uniform in its reactions than is the palate or the fancy.

Cultivated grounds admirably bring out the truth of our position. Let us assume that when staying in the country, we traverse at short intervals an area of twenty-four square miles. We pass woods, meadows, streams, hills, fields and pastures. Our range is so large that it admits of an immense expanse of attractive detail. Further, the changes we witness are not designed by us, nor are they artificial or abrupt. Look now at a garden. [*Test this.*] If there are beds of regular shapes, we condemn them as lacking sustained interest. If the arrangement of the flowers is artificial, it falls behind that of nature. The blossoms also lack ease and grace. The space being limited, gorgeous and rich forms abound. Nature's few petals become many; the delicate colours become pronounced. So cramped are the grounds' that there is no freedom, no natural environment for these earth-chained inhabitants. Hence we lack the pleasure of seeing something unexpectedly, or of resting between sight and sight. There is an attempt to make a tenth of a square mile equal in beauty to twenty-four. The result is a miserable failure. No one but an invalid, physically or æsthetically, will seriously compare man's garden to nature's paradise. A garden-bred poet is a monstrosity. [*Carefully study gardens and town parks.*]

Thinking and observing are not effortless processes, and the greater the obstacles consequently, the more strained and concentrated the attention. There is a condition, speaking of outlines, when the attention is readily satisfied; and the objects in connection with which this happens are called beautiful. An all-powerful mind or brain would be unable to see any beauty, for the necessary degree of attention would be absent. So, on the other hand, children and savages, lacking as they do the power of quiet contemplation, are naturally unable, except within the narrowest compass, to appreciate what is beautiful. [*Experiment.*]

Ruskin supplies us with a fine example of what is revealed by a close intimacy with nature. I give the passage in full: "A steep bank of loose earth of any kind, that has been at all exposed to the weather, contains in it, though it may not be three feet high, features capable of giving high gratification to a careful observer. It is almost a facsimile of a mountain slope of soft and decomposing rock; it possesses nearly as much variety of character, and is governed by laws of organisation no less rigid. It is furrowed in the first place by undulating lines, caused by the descent of the rain; little ravines, which are cut precisely at the same slope as those of the mountain, and leave ridges scarcely less graceful in their contour, and beautifully sharp in their chiselling. Where a harder knot of ground or a stone occurs, the earth is washed from beneath it, and accumulates above it, and there we have a little precipice connected by a sweeping curve at its summit with the great slope, and casting a sharp dark shadow; where the soil has been soft, it will probably be wasted away underneath until it gives way, and leaves a jagged, hanging, irregular line of fracture: and all these circumstances are explained to the eye in sunshine with the most delicious clearness; every touch of shadow being expressive of some particular truth of structure, and bearing witness to the symmetry into which the whole mass has been reduced. Where this operation has gone on long, and vegetation has assisted in softening the outlines, we have our ground brought into graceful and irregular curves, of infinite variety, but yet always so connected with each other, and guiding to each other, that the eye never feels them as *separate* things, nor feels inclined to count them, nor perceives a likeness in one to the other; they are not repetitions of each other, but are different parts of one system. Each would be imperfect without the next to it" (*Modern Painters*, 1873, pp. 309-10). This passage, quoted by Bosanquet, is supposed to "illustrate the beauty of characteristic expression" (*A History of Æsthetic*, 1892, p. 449); and if this be so, the reader has here Dr. Bosanquet's view in a nutshell.

In another passage, speaking of the sublime in architecture, Ruskin says: "It is a noble thing . . . to make the face of a wall look infinite, and its edge against the sky like an horizon : or even if less than this be reached, it is still delightful to mark the play of passing light on its broad surface, and to see by how many artifices and gradations of tinting and shadow, time and storm will set their wild signature upon it ; and how in the rising or declining of the day the unbroken twilight rests long and luridly on its high lineless forehead, and fades away untraceably down its tiers of confused and countless stone" (*Seven Lamps of Architecture*, 1897, pp. 140-1).

The organic view of the beautiful which is here put forward is illustrated by facts which are in part only identical with those dealt with in Æsthetics. Men often sit before a blazing fire watching the flames, or look out of the window when it rains or snows, or note the dripping of water into a fountain. In such cases we may say that there is æsthetic gratification in so far as the organic conditions mentioned in the text are satisfied. The variety of detail here is generally sufficient to occupy the attention; but discontinuous observation keeps satisfaction at a very low level. Such activity is disinterested, and agrees with our definition of the beautiful ; yet the absence of close organic connection changes it into something almost entirely different.

237.—INFERENCE.

We have thus far proceeded on the assumption of a sense uninfluenced by the environment; but this supposition, we know, is gratuitous. We will now correct this impression, and explain what would otherwise appear anomalous.

We sometimes insist on one aspect of an object. Being strongly in favour of a truthful rendering of things, we come to believe that a picture should hold the mirror up to nature. Guided by such considerations we are readily fascinated by paintings of this order. We turn to them and admire them passionately. Our eyes feed upon them like a bee nestling in a blossom, extracting the nectar of delight. We are transported in thought to the scenes called up. However, another man, who is primarily attracted by general impressions, loves the canvas which, while only hinting at the facts, suggests the mental attitude of the imaginary spectator. To the impressionist a scene true to nature repels, for he finds no soul therein. He asserts that a beautiful piece of country is transfigured by him who gazes at it. He cries aloud that only that art is great which takes cognisance of the mode in which we react on what is before us, and which re-instates the atmosphere of indefinable feeling which envelops us when lost in admiration. So, too, within the same school one man demands that pictorial art shall serve the ideal, while others ask that it shall present the various phases of life. As with pictures, so is it with the related arts.

The sportsman, again, has a keen sense of the beauty of thoroughbreds, looking them over with evident enjoyment of make and shape, though outside his own particular hobby, he may have few interests. The admirer of the shire horse, on the other hand, may see no special beauty in the thoroughbred. In both instances, predilections determine what shall be praised; and in each case there is an objective basis for the belief. If the two types of horse displayed few details, the attention could not be fixed on them for any length of time. Both individuals have specialised, and therefore disagree. The fact that their pursuits have probably suggested the respective objects of their admiration does not affect our conclusion. So also a woman who shows taste in her dress and in the arrangement of her furniture, has perhaps in other respects little veneration for the beautiful. She goes into ecstasies over the latest fashions, her drawing room is a model of taste, and yet a sunset leaves her cold. The pressure of the environment has been one sided, and her training forces her to insist upon the beauty of one class of objects alone. Were it not for that, she might perhaps have been indifferent to her idols; but as it is her restricted reasoning and her narrow outlook control her interests, and, in the same way, predilections, due to many influences, lead men to single out some dimly-lit corner where they erect an altar and worship.

This attitude has, as its correlative, a blindness to much that is beautiful. Walking with eyes never raised, the most lovely sunset fails to impress us. The sky is aglow, but not for us. Our attention has never been drawn to it; we have not suspected anything beautiful there; we have had no inducement to let our eyes wander; there has been resting on us the dead hand of a belief that beauty does not lie in that direction. All our habits have combined to divert our attention. Hence we never look, except vacantly, and never know. We have grown into ignoring the beautiful. When we were little children we played about in the meadows with no patience to contemplate a beautiful sight. We have grown accustomed to an object, and because it has not fallen within the circle of our practical life, we have never fixed our attention on it sufficiently to determine its value. So the child bred in the country, while yet too young to discriminate, hears the birds' songs, but not having any actual dealings with the feathered songsters, he comes to ignore them as he does the surrounding atmosphere. So, too, the various changes in the seasons are overlooked, because they do not actively enter into the routine life of the child. For this reason much that is beautiful never appeals to us, and most things would never do so, but for stimulating forces outside us. It requires social development to direct men to an æsthetic or other discovery, for we do not spontaneously respond, and are so guided by habit that we only rove within the narrowest limits. It is because we have not previously looked at a thing that we ignore it now. If we should venture far without guidance, the world is so mighty a labyrinth, and we are so devoid of art, that we are certain to lose ourselves. Only activity, stimulated from without, enables us to see the true relations of an object.

Why, for instance, does water rise only to a certain height in a pump? How evident is the answer to one who knows it. 'When we move our arm rapidly, we note something which resists and touches us. That something we call air. That something, since it behaves like elastic fluids, must resemble them, for it occupies space, it can be displaced, and it presses against objects. Hence it is but a more refined fluid, and has weight. Accordingly the water rises in the exhausted receiver, until a column of it is balanced by the weight of the atmosphere which presses on the exposed water in the well, and no higher.' How simple! Yet it took ages to establish this truth, because at every turn some false doctrine or some fallacious argument led men away from the truth.

It is for such reasons that our æsthetic outlook is capable of expansion, and that we can observe now this, and now that. There was no fate to force primitive man to the discovery that a gentle stimulus best satisfies the mechanism of attention, and that the contemplation of certain objects is a means to such an end. *Extensive and correct reasoning, as all ratiocination, is need-determined re development* (sec. 102). [*Test.*] An average man, assuming that he is not engrossed in purposive pursuits, will, unless socially stimulated, almost entirely ignore the realm of the beautiful, in the deeper sense of the word. Yet, granted favourable conditions, the same man will show genuine admiration for many objects. He will seek to penetrate the starry depths; he will gaze on a sunset till he seems turned to stone; he will lend a willing ear to the sea, and he will love mountains, hills and dales. There dwells in him a yearning for the beautiful, for an ideal satisfaction of the attention, and this once developed, he will tend to gratify it like other cravings. His desire will not be subjective, in the sense that he can contemplate indifferently whatever object he arbitrarily chooses. His choice lies only within the limits of those things which are able to oil the wheels of the attention machinery.

238.—MISLEADING BELIEFS.

Misleading beliefs introduce a disturbing factor in æsthetics as everywhere else. We are told, for instance, that a cold morning bath is invigorating and pleasant; we act on the suggestion; and we think we are much fresher and better for the dip. Our friends, however, arrive at a different conclusion. [*Collect such cases.*] They notice that while pretending to be full of activity, we really show less elasticity than usual. They note that while we feign cheerfulness, we are more low-spirited than is our wont. Nevertheless we go on for years with such delusions, never aware that we are acting a part. The contrary feelings exist; but, owing to an *idée fixe*, we do not seek to explain them. We are fatigued, and think ourselves refreshed. We are miserable, and believe that we are in high spirits. Be it observed that our fallacious reasoning has not affected the facts; it has only warped our judgment. This frequently happens in matters æsthetic. Deceived by the description of some wretched daub as a fine picture, we buy it and often stand before it, apparently lost in admiration, even asking our friends to join in our worship. We think that outside the great galleries there is not a finer picture in the world. For months we admire its supposed beauties. Yet a close examination of our condition shows that what we could not do, we have not done; that we have fooled ourselves; that we have not really admired the picture. To make the case perfectly simple, let us imagine that a plain blue sheet is the supposed object of our admiration. To gaze at that for long without falling asleep is obviously impossible. [*Try.*] The attention has nothing before it, and instead of a gentle stimulus, there is none whatever. How, then, is the illusion sustained? By our thoughts wandering. Blinded by prejudice we do not notice that the pleasure yielded is a mimic pleasure, that the satisfaction is forced, and that the time is not occupied with the blue sheet. We may believe what we like; but we cannot admire what is not of itself admirable. Our judgment may be deluded; but not the æsthetic sense.

The number of treacherous beliefs is very large, probably much larger than we suspect. Sometimes individuals, sometimes whole nations, reason themselves into the most stupid courses, almost derationalising their natures. On the one hand superstition sometimes provides a semblance of happiness, making its sour-faced devotees believe that perfect felicity is vouchsafed to them; on the other hand, people raise self-gratification into a philosophy, arguing that they are husbanding their happiness when they are really employing the best means of making their existence as insipid as a tasteless apple, or perhaps positively undermining the possibilities of a satisfactory life. We need not study in detail the part which erroneous belief plays in æsthetics; but let it be clearly understood that it does play some part, and that pretended admiration has no objective justification. Such error will often make a theory of the beautiful appear monstrous, and must, therefore, be duly reckoned with. Unquestionably, misleading beliefs enter into all our thinking to some extent; but that need not trouble us, if only we are aware of the fact.

239.—EDUCATION.

Education influences us greatly, as is natural, for the attention process is sensitive to training. Hence there results another disturbing factor which we cannot pass unnoticed. The attention, when untrained, naturally cannot apprehend or embrace as much as when trained. The child and the savage, therefore, will only be able to appreciate simple designs.* The moment these designs are not simple, or are on a large scale, they turn away from them. The object is too unfamiliar, and its comprehension requires more than a gentle stimulus. Putting aside secondary considerations, unelaborated forms, freely repeated, please primitive people as also do pronounced colours, indifferently arranged. However, with training comes ease, and these designs and colours are outgrown. Men then require something more subtle and more satisfying, and forms must no longer be so easily readable or so readily comprehensible. The primitive designs are consequently abandoned in favour of less primitive ones. Accordingly, for those observing a sunset for the first time, the mass of detail and the novelty of the sight almost repel because they tire. Practice, however, soon overcomes this. By constant readjustment we discover the way to obtain the maximum of enjoyment with the minimum of effort, while we learn that only discipline, unpremeditated or deliberate, brings the highest satisfaction. In this way our life resembles that of an eagle: as we grow older so our sunward excursions become bolder. What was difficult to understand once, is easy now; what is easy now, will be of no interest later in life; and what was easy a long while ago, now leaves us unaffected. There is consequently with the learner, as we should expect, a growth of power. To begin with, it was difficult for us to see much in pictures; they made on us a transitory impression, for only what is strange and striking appeals to us at first. Then gradually the unfamiliar becomes familiar, strangeness and novelty are discounted, and we face the beautiful in all its purity. Our attention feels at home when that stage is reached. It is the same throughout the whole development in the appreciation of the beautiful, where the nature and impressibility of the attention mechanism are alone decisive. From the comparatively simple we rise to the relatively complex; and, in every instance, the craving for easy-flowing attention is the controlling factor. When we ignore the education of æsthetic development we may easily believe that likings are not objectively determined, and it is from this that arises much of the present confusion of thought on the subject.

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* "At all events, get rid of equality; leave that to children and their card houses" (Ruskin, *Seven Lamps of Architecture*, 1897, p. 235).

240.—FASHION.

Rapid changes in fashions obey, of course, the same rules. [*Examine such changes.*] Something is admired which is pretty in itself, enhanced by novelty and recommended by social circumstances. Time passes, and another object takes its place, and then another, and so on. Why the great admiration at the start? Why the cooling of the ardour and the ultimate rejection of what was once admired? The reasons are not far to seek. At first, the fashion being new, our attention is for some time absorbed in it. Then, the detail being restricted, interest wanes. Lastly, when we become thoroughly familiar with it, it ceases to attract us. There are important secondary factors. The admiration of the butterfly of fashion, for instance, is of a restless type. There is a capacity for excitement, but not for calm contemplation, and novelty is eagerly sought for, because of various society reasons. In this excitement it not infrequently happens that fashion's choice falls on something that is not beautiful. In such a case admiration is fictitious. We give praise to that which does not appeal to us.

241.—SECONDARY FACTORS.

In the contemplation of the beautiful, secondary factors, in one form or another, enter almost as a constant. If we look at the sea, at the sky at night, at a sunset or at a landscape, the *bulk* of the object of attention undoubtedly fascinates us, since gigantic proportions are in themselves an attraction. Thus a building like St. Peter's or St. Paul's affects us to some extent by virtue of its dimensions. [*Test.*] If we were twenty times our present size, or if buildings were commonly many storeys high, there would be a distinct difference in the effect which, for instance, the cliffs of Dover would have as compared with what we now feel at the sight of them.

What we have just said as to relative size is confirmed by Ruskin's definition of the Sublime as "that degree of magnitude which is the lowest at which sublimity begins, rudely definable as that which will make a living figure look less than life beside it" (*Seven Lamps of Architecture*, 1897, p. 133). On the subject of the Sublime, see also the third chapter in the above work.

Novelty is another factor. The sky often shows a number of changes which are, in their way, unique, and naturally these interest us, and we study them. In this way we frequently satisfy curiosity, while the time spent in the acquisition of knowledge is also included in our general estimate of the value of the contemplation of the beautiful. If we went into the matter more deeply, we should perhaps discover that a subdued curiosity is almost a constant in admiration. We both enjoy and learn, though a moment afterwards we forget the results of our observation.

Skill also influences our judgment. Men of a theological bent admire what they describe as design in nature; while all, or nearly all, allow their judgment to be influenced by the technique and the labour in pictures or statues.*

Associations play a not unimportant part. No sane individual would agree to admire anything and everything regardless of social conventions. From some pictures he will turn in disgust; they offend his tastes. To others he will eagerly turn, for they appeal to his deeper feelings. In this way associations, good and bad, influence our æsthetic judgment, though we should beware of calling a thing inherently ugly because it offends our moral sense.

The diffused aura of interests has a subtle power of its own. Latent romances, a hardly suspected fairy world, dim visions, and semi-articulate sounds group themselves around an impressive sight. These are almost unanalysable. They are made up of inarticulate feelings and half-formed imaginings. They are to our thought what the confused hum of a town is to the sense of hearing, and in such an atmosphere, enveloped in half-remembrances, we live when lost in admiration. They may be considered an integral part of the beautiful. The attention constantly wanders from the object to bask in the delightful feelings produced. It is this reverberation of the beautiful which impressionist painters attempt to incorporate in their works.

Allowance must also be made for organised reaction. Once we love beautiful sights, we shall mechanically continue to love them, the interest being automatically maintained. One reason for going to the gate to see the sunset is that we have often done the same thing before. Our likings will lead us on irresistibly because they have become organised, though routine can make no difference to what is beautiful. [*Test the above statements.*]

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* "There is not a cluster of weeds growing in any cranny of ruin which has not a beauty in all respects *nearly* equal and, in some immeasurably superior, to that of the most elaborate sculpture of its stones: and that all our interest in the carved work, our sense of its richness, though it is tenfold less rich than the knots of grass beside it; of its delicacy, though it is a thousandfold less delicate; of its admirableness, though a millionfold less admirable; results from our consciousness of its being the work of poor, clumsy, toilsome man. Its true delightfulness depends on our discovering in it the record of thoughts, and intents, and trials, and heart-breakings—of recoveries and joyfulnesses of success" (Ruskin, *Seven Lamps of Architecture*, 1897, pp. 95-6).

Alison, in his *Essays on the Nature and Principles of Taste*, 1815 (first ed. 1790), applies the association theory in most thorough fashion to the subject of the beautiful. Interesting associations offer to him a complete explanation of the problem we are considering. He sums up in this way: "Wherever the appearances of the material world are expressive to us of qualities we love or admire; wherever, from our education, our connections, our habits, or our pursuits, its qualities are associated in our minds with affecting or interesting emotion, there the pleasures of beauty or of sublimity are felt, or at least are capable of being felt. Our minds, instead of being governed by the character of external objects, are enabled to bestow upon them a character which does not belong to them; and even with the rudest, or the commonest appearances of nature, to connect feelings of a nobler or a more interesting kind, than any that the mere influences of matter can ever convey" (ii, p. 428). Fechner, in his *Vorschule*, 1876, takes a similar view to Alison's. He claims that men look upon the orange as the most beautiful of fruits, because of the romantic associations with the south which it calls up (i, pp. 87-9), a claim which few men would agree to. Brown held that Alison's associated images did not, as a rule, exist. With this I certainly agree. However, he went farther, arguing that we were influenced by a mean, or cluster, or residue of associations, including the opinions which we have imbibed. "When we behold a beautiful form, all the images suggested by it, live in like manner in it" (*Lectures*, 1824, iii, p. 149). His argument is well maintained throughout; and I see no reason to doubt that predilections enter considerably and vitally into æsthetic judgments. Nevertheless, the power of these suppressed associations lies, if I mistake not, in the fact that they form a desirable whole for the attention to contemplate. The purest beauty can only be said to exist where there is no portion of a contemplated total which is not considered part of an organic whole. Other ingredients, non-contemplative ones, must not be regarded as truly æsthetic in character. Still, Brown goes too far when he says that he has "found sufficient reason to ascribe to this slow and silent growth of circumstances of adventitious delight, almost all the beauty which is worthy of the name" (*Lectures*, iii, p. 150).

It is not so easy to decide whether colour, and the groundwork of form generally, should be admitted as æsthetic factors. Kant (*Kritik der Urtheilskraft*, 1790, §14) argues against such admission, classing sensory effects as agreeable rather than as pleasing. I am, on the whole, inclined to think that ease of apprehension gives to sensation its desirable character.

Burke, in the work already quoted, dismisses the doctrine of right proportion as a cause of beauty (pp. 156-70), that of fitness (pp. 170-5), and that of perfection (pp. 176-9). Burke's criticisms are to me the only readable portions of his book.

242.—The Æsthetic Standard.

What I have said implies, in one sense, that there is no absolute standard of beauty. That which appears beautiful to one man, does not necessarily appear so to another, and we also, as we have seen, outgrow forms of beauty. This argues a standard relative to the state of the attention apparatus at any given moment; but if this is so, there yet remains a definite measure by which to judge objects, and by which to separate the higher from the lower. Still, to avoid the confusion which is introduced by the personal equation we can fall back on an abstract standard. According to this standard, objects would be weighed by the first effect they leave on spectators, or by their æsthetic constitution. A man who is tired of a picture, may thus find a common standpoint with another who sees it for the first time. While, then, for scientific purposes we recognise the relativity of the beautiful, for practical purposes we would set up an abstract ideal, based on some mean of impressions. We call an object beautiful, because it has the marks which normally go with beauty, though, for assignable reasons, we are not impressed by what we integrate or perceive.

Here are some additional opinions regarding the subject of æsthetics. In the second volume of his *Essays*, 1891, Spencer discusses various aspects of æsthetics. He points out, among other things, that "the appliances of one era serve as embellishments to the next," and that "equally in institutions, creeds, customs, and superstitions, we may trace this evolution of beauty out of what was once purely utilitarian" (p. 370,—this essay was first published in 1852). Speaking of personal beauty (essay first published in 1854), he remarks that "the saying that beauty is but skin-deep, is but a skin-deep saying" (p. 394). Here, too, the obscured states must be supposed to form a solid part of one's conception of personal beauty, and not to exclude the physical features. In *The Nature of Gothic*, 1892, Ruskin supplies us with the supposed characteristics of the gothic style, characteristics which reflect the great art-critic's view of the beautiful, and which also give authority to our conception of æsthetics. The first mark is that of Savageness, imperfection being general because of the absence of undesirable mechanical repetition; then we have the principle of Changefulness which yields variety; then comes Naturalism, where the works of art reflect nothing morbid nor soft, but that which is hearty, human and all-embracing, this resulting from the workman's freedom of choice; and then come Grotesqueness, Rigidity, and Redundance which offers something pleasant to everyone. Morris (*Hopes and Fears for Art*, 1882) can only be regarded as an enthusiastic disciple of Ruskin. Fechner (*Vorschule*, 1876) gives the following æsthetic principles: (1) the æsthetic threshold, (2) æsthetic helps, (3) combination of multiplicity in unity, (4) truth, (5) clearness, and (6) association. Baldwin (*Feeling and Will*, 1891) explains the æsthetic nature of curves physiologically. He holds, and perhaps rightly, that "the normal movement of the eye, except in its vertical and horizontal axes, is a curve of gentle and somewhat irregular curvature" (p. 237), and he is probably correct in stating that "the ideal of form is indicated by the most facile and pleasurable adaptation of the eye at once to detail, and, by easy transition, to the plan as a whole" * (p. 237). We have seen Burke pointing to the lion as a specimen of something which lacks beauty, and Fechner making the homely looking orange the king of beautiful fruits. In the same incredible spirit Baldwin tells us that "the beauty of a landscape is cold and formal until the smoke of a peasant's hut, or the spire of a country church, is added to give it a touch of human interest" (p. 234). Bosanquet (*A History of Æsthetic*, 1892) thinks that the beautiful lies in expressiveness. "Among the ancients the fundamental theory of the beautiful was connected with the notions of rhythm, symmetry, harmony of parts; in short, with the general formula of unity in variety. Among the moderns we find that more emphasis is laid on the idea of significance, expressiveness, the utterance of all that life contains; in general, that is to say, on the conception of the characteristic" (pp. 4-5). The opposition between ancient and modern æsthetics, it appears to me, is artificial; rhythm, etc., are necessary elements in æsthetics now; and significance was not ignored in old times. Without the former, as Fechner (*Vorschule*, ii, pp. 64-8) has pointed out, the characteristic ceases to be a distinguishing mark of the beautiful; and without the latter, rich natures are left unsatisfied. The expressive closely connects the beautiful with life and conduct, and hence serious natures shrink from an art which is out of touch with the deeper realities. Everywhere Bosanquet adheres to his text that the characteristic is the beautiful, never properly explaining, defining or illustrating his position. Marshall (*Æsthetic Principles*, 1895, p. 114) is very vague, as witness this definition. "The beautiful is that . . . which produces effects in us that in retrospect remain permanently pleasant . . . . . . The ugly . . . . is that which produces effects that remain permanently painful in retrospect." Bradley (*Appearance and Reality*, 1897, p. 464) defines the beautiful as follows: "That which is æsthetic may generally be defined as the self-existent emotional." Allen (*Physiological Æsthetics*, 1877, p. 39) argues that "the æsthetically beautiful is that which affords the maximum of stimulation with the minimum of fatigue or waste, in processes not directly connected with vital functions."

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* See also Guéroult, *Du Mouvement dans les Emotions Esthétiques*, 1881.

None of the books or essays on æsthetics which I have read show an inclination to face directly the psychological aspects. Lovers of the beautiful seem to have shrunk from the task of analysing that notion, and for a similar reason the beautiful in nature, which is not to be found in cloistered studies, has been almost entirely ignored.

243.—PROSE AND POETRY.

I have defined the beautiful as that, the contemplation of which, of itself, occupies the attention. The beautiful in connection with language falls, therefore, within this definition. Let us consider an example, the introductory lines in Browning's *Pippa Passes*.

> "Day!
> Faster and more fast,
> O'er night's brim, day boils at last:
> Boils, pure gold, o'er the cloud-cup's brim
> Where spurting and suppressed it lay,
> For not a froth-flake touched the rim
> Of yonder gap in the solid gray
> Of the eastern cloud, an hour away;
> But forth one wavelet, then another, curled,
> Till the whole sunrise, not to be suppressed,
> Rose, reddened, and its seething breast
> Flickered in bounds, grew gold, then overflowed the world."

Everything beautiful in literature appeals to the senses. Milton's *Lycidas*, *L'Allegro*, or *Il Penseroso*, Gray's *Elegy*, Goldsmith's *Deserted Village*, Wordsworth's *Ode to Immortality*, Shelley's *Skylark*, Tennyson's *Locksley Hall* and *In Memoriam*, Bryant's *Thanatopsis*, and similar masterpieces alike bear out this contention. Indeed, it is impossible to re-develop any fine poem which does not primarily appeal to the eyes. [*Test this.*] Colourless and yet beautiful poetry implies almost as great a contradiction in terms, as warm ice. [*Does it?*] A really blind Milton could scarcely appeal to us on the æsthetic side. The Milton we love abounded in imagery. Is there, then, no poetry without colour? Such poetry, we know, exists and may even be of high quality. Still, apart from sonority and happiness of arrangement, poetry of this kind is not beautiful. What appeals to us here is the thought; and that leaves our æsthetic sensibilities unaffected. Pope's brilliant couplets, which express with ease what is difficult, please us because they are didactic and make no great claim on our attention; but they scarcely touch our æsthetic sense. Such poetry serves all kinds of purposes, but never those of æsthetics. Let us, however, note that even in these cases of eyeless poetry the few grains of æsthetic gratification are derived from the readiness with which the method of presentation is apprehended. Remove the easy flow of word and thought, make the trend uneven like a neglected highroad, and every spark of delight is gone.

The explanation of this fact lies in the principles which are expounded in this chapter. I have spoken of the pleasure which we derive from the vision of natural objects, and we have seen these transferred to canvas. In poetry the impressions which these objects created in the spectator, are brought before the reader. A poet who has a rare appreciation of the beautiful communicates his knowledge, inner mingled with outer, to his fellows. In proportion as the attempt is that of a true seer, to that degree do we return to his descriptions as to a sunset.

The nature of beautiful poetry is determined. Let us make sure of a few points. In mediocre poetry the imagery is often of a threadbare type, and does not, in consequence, fix the attention. Again, the poem sometimes rambles on without pictorial or descriptive passages, and the piece is then æsthetically tame. In other cases we find a large variety of commonplace similes, and these the attention no sooner detects than it rejects them. So also vagueness is a serious defect the absence of clear notions, or the inability to express them, results in the would-be poet telling us next to nothing. We obtain no definite information, and are, therefore, dissatisfied. He has a charlatan's vocabulary, using a few inexpressive words to stand sponsor to a large variety of shades of thought. [*Test.*] Good poetry is without these faults. The gigantic lingual resources of the Elizabethans are well known. They are continually varying their turns of speech, their adjectives and verbs alone adding much to the richness of effect. So, too, their imagery is remarkably fresh, plentiful, apposite and imposing. Instead of using a small stock of trite phrases, which have lost the power of appealing to us, they constantly aim at originality. Their own varied life is interwoven with their work; or else they borrow from such remote sources that the effect, on at least the modern reader, is not diminished. The quality of the thought contributes to the result. The Elizabethans speak not only of sweet and tender things, but of great things. They express frequently a profound observation in a form which instantly appeals to us, as when Massinger says of Love:

> . . . . thou art feigned blind,
> And yet we borrow our best sight from thee."

Had he written forty lines instead of two, and resorted to no suggestive pictures, we should have been bored, and perhaps we would not have understood him. Yet the abstract thought, attached to an appropriate image, becomes at once clear and beautiful. Still, it is not enough to have beautiful lines or couplets which, like tiny caskets, hold precious notions. The graduate in literature requires a larger horizon, a concept, which though complex shall yet be readily grasped. Accordingly, in a sonnet, the various pictures move round a common centre, and together they express one theme. And, likewise, a century of sonnets are strung on one thread, and form one thought. It is so with Tennyson's series of commemorative poems on Arthur Hallam, which have a common source. Take, again, an outburst such as that with which Browning's *Pippa Passes* begins. The description of the sunrise, which I have quoted, like so much else in Browning, is a remarkable illustration of the training required to reach the higher peaks of æsthetic creation and enjoyment. [*Consult that poem.*] An ordinary person would be utterly baffled in trying to scale them. A Pippa would in vain attempt to break out into such language, embodying, as it does, in so involved a form such minute and discriminating observation and such wide knowledge.

The love of poetry is built on a strong foundation. Given our brain as the type of our present state of development, and no other kind of poetry could possibly satisfy us. We cling to earth and to sense, because they alone satisfy the attention process. [*Is that so?*] We clothe even our most abstract thoughts in material garments in order to make them attractive, and nothing is so holy but we enlist some sensuous metaphor to give it the additional charm of beauty.* On the other hand, we are deeply affected only by that poetry which deals with what is not ephemeral, and it is accordingly our larger interests which are most suited to rhythmic treatment. Still, since there must be no strain involved, profound themes are dwelt on suggestively, as they haunt us, rather than minutely and precisely, as in the lecture room. Our love of sunsets, of artistic representations and of imagery is hence natural, and if, therefore, human nature remains the same, we need not fear that a time will come when men will smile at our prostration before the sensuous. Abstract thought is difficult to grasp, and so long as this is so it will be vain to substitute it for sense systems. Let us suppose, however, that it served to occupy the attention agreeably. Then the abstract would delight us; we should go into raptures over the definition of a noun, while on the other hand, the sensuous, except in the most complex forms, would cease to have any fascination for us. Browning's most perplexing poems would then perhaps be selected as nursery rhymes, while poetically conceived metaphysical conceptions would soar as far above Pippa's morning song as that transcends *Twinkle, twinkle, little star.* It is possible that even our most abstract notions would be too simple for poetic treatment. However, it would be tedious to prolong this inquiry. The beautiful changes with the nature of the attention mechanism, and as that varies so vary the objects of our admiration. In the absence of an attention process, the fundamental notion of æsthetics loses its meaning. Our conclusion must, therefore, be that non-corporeal beings possess capabilities entirely different from those of corporeal humans.

What has been said of poetry holds good also of prose. There must be something in the style or in the matter which makes assimilation desirable. Here also the attention is held enthralled by a gentle stimulus, though rhythm is almost entirely dispensed with and there is more freedom of movement. Sensuousness is generally an essential. Bacon, Milton, Emerson, O. W. Holmes, Jean Paul Richter, and others, shine by its light. There are yet other methods. One man describes striking events with a brilliancy which allows of our easily picturing the scenes; another throws a vivid light upon the inner life of others. One succeeds in delineating the passions; another charms us by his mosaic-like methods; another attracts us by his wit; while yet another employs every one of these methods in turn. Except in occasional passages, no attempt is made in prose to carry us away æsthetically, and some derived interest, therefore, is needed to make the reading tolerable; nor do we ever find in prose the intensity of delight which poetry produces. When prose reaches its highest level it becomes, as we should expect, prose-poetry. Then the rules of poetry, except those of metre, have to be obeyed, though even here there is not that complete enchantment which supervenes on reading an exquisitely wrought piece of verse. As a compensation, however, a larger quantity of prose-poetry may be produced, and we can read more at a time without becoming surfeited; still when the writing is highly charged with imagery, it is difficult to read quickly or much at a time. So varied are the methods of appeal that it is not easy to enumerate them. We can only say that in each case the style and matter must be such as will yield sufficient food for the attention, and that the details must be combined in systems which are neither too easy nor too difficult of comprehension. Books, consequently, will interest us æsthetically in precisely the proportion in which they satisfy the objective test. Compositions which are obscure and disconnected appeal to us as little in prose as in poetry. A small vocabulary, an absence of delicacy and discrimination, lack of similes or the use of trite or poor ones, a flitting to and fro from subject to subject, triviality, and similar failings, are signs that æsthetically the work will displease us.

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* So Ward, *Psychology*, 1886, p. 70: "Art eschews the abstract and speculative; however plastic in its hands, the material wrought is always that of sense."

There is no very clear distinction between poetry and prose; at least the historic tendency has been to minimise existing differences. The cruder Elizabethan form of play, for instance, was rhymed throughout; and it was considered a great improvement when the rhyme, as an essential, was dropped. After that we encounter metrical plays where, as a rule, every line constitutes a sentence and every sentence a line, the line being decasyllabic. However, as we approach the Elizabethan drama in its ripest condition, we note a tendency to suppress the jingle, to add an eleventh syllable, and to avoid sentences which end with the line or are equal in length to a line. In short, all but the rhythm has been swept away. Add to this that a good reader presses the sense and largely suppresses the metre, and all we have left is smooth reading, not so much musical as not unmusical. Similarly, with a good reader ordinary lyric poetry loses perhaps all its qualities, except that of not being unmusical. Hence it becomes a pertinent question whether the good reader's interpretation should not be adopted by the poet, rhyme and arrangement in lines being avoided. We can go still farther. It is not uncommon in lyric poetry to ignore very considerably the length of line as well as the arrangement of accents. At this point good prose begins. Here, too, what is unmusical is considered bad composition; and a certain swing is always demanded. The only remaining difference, then, is that in poetry metre is in general distinctly traceable, while in prose this is not the case. Nevertheless, to balance this, it is commonly agreed not to regard as poetry that which lacks distinction. In the same way we might contend that where art is absent, prose ceases to be present, *i.e.*, there exists doggerel prose as well as doggerel poetry. Brilliancy, fancy, imagination, weight, depth, clearness, subtlety, comprehensiveness, music, mark good prose. Some writers of the seventeenth century, like Bacon and Milton, and a host of writers of the eighteenth, like Addison, Hume and Gibbon, supply us with good examples of the nature of studied prose. To-day the art of prose is almost dead. Occasional fine sentences or passages are embedded in tracts of unattractive soil. It is as if the painter presented us with a daub wherein by careful search we are able to detect a few good points. Not so with Milton, Hume, Gibbon, and their fellows, for what these men lay before us is a true art product in which every part aims at perfection. Perhaps we may compare ordinary writing to *necessaries*, prose to *comforts* and poetry to *luxuries*, ignoring any subtle partition.

If this psychological interpretation of style be accepted, it will be seen that what has been said concerning visual beauty holds good to the utmost detail of lingual beauty. As, through social endeavour, the intellect and the emotions increase in keenness and depth, so the obviously formal in language is gradually displaced by a style rich, full, brilliant, subtle and varied. Hence the measure of the superior style is solely the social development of the attention at any period, the method employed being otherwise indifferent. Jean Paul conquers by his brilliancy, Victor Hugo by his warmth; Emerson by his depth, Carlyle by his insight, Scott by his historic background; Thackeray by his minute descriptions, Dickens by his kindly humour; George Eliot by her sympathies; and Bjornson by his subtle touches. As long as the attention is held by the manner of exposition, so long is the style to be commended.

In connection with style, the student may be referred to Hume's essays *Of Simplicity and Refinement in Writing*, and *Of the Standard of Taste*, to Herbert Spencer's essay on *The Philosophy of Style* in the second volume of his Essays; and to Mr Frederic Harrison's *Tennyson, Ruskin, Mill, and other Literary Estimates*, 1899. See also Guyau, *L'Esthétique du Vers Moderne*, 1884.

A study of the orator's art will show the essential need in oratory of systematised variety, precisely as in written prose or poetry, perhaps even more so.

244.—MUSIC, ETC.

It need scarcely be insisted upon that music, to be agreeable, must, equally with poetry, have regard to the nature of the attention mechanism. If we attend a concert as reporters, our attention is perhaps sustained, in the absence of habit, by some reward. Still, when no secondary interest compels us to follow the music, the mechanism itself must be gratified, or else our thoughts wander. Music, then, should offer a variety of detail, and should consist of a system the comprehension of which requires gentle exertion. It will not be difficult to show that, broadly speaking, this is the case. The music of savages, in its simplicity and lack of system, approaches very nearly to noise. Then comes the lyrical music, which alone attracts the uneducated: a song, now serious, now fanciful and now light charms their ear, or a few threads are woven into some unpretentious pattern. Lastly, come the sonatas, such as those of Beethoven. Here the variety and complexity are such that the musically untrained endeavour in vain to follow and enjoy the performance.

There is neither space nor is there a need to elaborate the matter further. What was said in sec. 236 with reference to outlines, holds good here in every respect. No doubt, there are peculiarities; but they do not affect the pillars of our theory. Such and such should be the demands of music to conform with our definition, and such they prove to be. Had we found sonatas appreciated by savages and not by civilised mankind, or songs taking the place of sonatas as we become more at home musically, the startling facts would have demanded an explanation. As it is, data and doctrine harmonise.

Gurney, in his monumental work, *The Power of Sound*, 1880, has a passage which goes to establish our position. He says: "The use of 'subjects' in music is a perpetual feature, and becomes most prominent in large and complex pieces, to which it is the great means of imparting organic unity" (p. 98). As I am a stranger to musical theory, I shall not enter into matters musical. I have frequently listened to music with the attention fixed on the separate sounds. I notice that while some instruments sound much more agreeably than others, there appears to me no relation between the agreeableness of a sound and the agreeableness of the system of sounds which forms the melody. The mere tones of the violin appear to me human in expressiveness; but certainly not specially agreeable. The preference shown for this instrument is due to the nice gradations of sound which it is capable of, thus enabling it to satisfy the attention ideally. Still, a single instrument gives us only shades of one tone or colour, while an orchestra supplies us with variety of colour as well as of shade, and hence an instrument would be ideal if it yielded both shades and colours. However, the chief delight of music seems certainly derived from the structure of a piece rather than from the series of single sounds of which it is composed. Ruskin (*Seven Lamps of Architecture*, 1897, p. 271) speaks of Architecture as "not essentially composed of things pleasant in themselves, as music of sweet sounds, or painting of fair colours." As to the elements of music, see Helmholtz, *Tonempfindungen*, 1877, and Gurney, *Power of Sound*, 1880. [*Consider the notable differences in sound quality between piano, violin, organ, flute and the human voice.*]

What is here said as to the organic nature of beauty in sounds is apparently contradicted by the music of birds. Not even the nightingale, the thrush or the skylark satisfies much our definition of the beautiful, though organic combination of sounds and variety of detail are most developed with those birds. We must, therefore, class the songs of birds as intermediate between beautiful things and such sights as a flaming fire or a fall of snow; and we must assume that environment and pleasant associations largely account for the attractiveness of the songs of birds. In that case the beauty would reside in a whole of which the special song forms a part only.

Lastly. Wherever the word BEAUTIFUL *is legitimately applied, the same foundation facts will be discerned. A beautiful sentiment, a beautiful character, a beautiful bon mot, a beautiful deed, a beautiful life, a beautiful thought, a beautiful moral, a beautiful arrangement, a beautiful movement, imply, one and all, that the object thus spoken of is contemplated by us because it has those characteristics, now well known to the student, which, of themselves, occupy the attention.* Further illustration is superfluous, as this definition covers each and every instance without exception. [*Test by rules in sec.* 136.]

245.—The Comic.

The recognition of the beautiful arises out of an incidence in the attention machinery the primary purpose of which is to satisfy the needs of the organism, while interest in the beautiful is principally needed to fill the interstices between the serious moments of life. The Comic, teleologically speaking, occupies the same position. It is one other means to prevent brooding and aimless or difficult reflection. It, like the beautiful, offers an ideal outlet for the attention. It, too, slips into the crevices left open by strenuous work and thought. It, too, has no justification except the office which it fills. [*Test.*]

In defining our subject, we assert that *the Comic implies a humiliating situation where the sense of malice is aroused so far as it satisfies and mechanically occupies the attention.* [*Examine this definition.*]

The various known forms which the Comic assumes well illustrate this. The popular "tall stories" from America are almost of a uniform character. Thus, to indicate the speed of transatlantic trains, we are told that a man was leaning out of the window to bid good-bye to some one, when he discovered that he was hailing one of the porters at the next station. In America, exaggeration is the prevalent mode of provoking laughter. Irish stories have a different trend. Under the guise of reason an utterly inadequate explanation is proffered. Thus a man insists that the rifle is his; that, in fact, it had been in his possession ever since it was a pistol. Americanisms and Irishisms are pretty nearly always true to the type they represent. In Shakespeare's plays we find two methods prominent. One of these runs through the majority of the plays, and is a mode of repartee, connected with euphuism. There is in it an interminable doggedness on both sides to construe a remark in a sense not intended by the speaker, or else to draw unsuspected conclusions from the words In *Hamlet*, in *Love's Labour's Lost*, in *As You Like It*, in *Much Ado About Nothing*, and, indeed, in most of Shakespeare's attempts at humour, from his first to his last play, this is almost the only class of wit resorted to. The other method in Shakespeare's works, one fairly general in literature and life, is to make a man use words which he does not understand, as with the constable in *Measure for Measure*, Dogberry in *Much Ado About Nothing*, Launce in *Two Gentlemen of Verona*, the hostess in *Henry IV*, the mob in *Henry VI*, or the gravediggers in *Hamlet*. There is a closely allied sub division where a man is muddle-headed, as in the case of the characters just mentioned, and rambles in his thought. *Repartee* allows, of course, of wide expansion, and is not necessarily verbal or trifling. It is often absolutely crushing, and when that is the case, and the argument is continued on the same level, the highest results are obtained. Caricature attains the same end of pleasing us, by bringing out in striking relief certain abnormalities. Farce of every type produces the same effect, and is caricature in action. At the same time we must recognise that sheer stupidity does not lead to fun any more than to malice. Thus, if the Irishman had insisted that the rifle was his because he once was a boy, we should merely suspect his sanity. So a child trying to jest in imitation of his superiors, fails completely in its object. Some traceable relations must always be present in the Comic, and the mixture of the reasonable and the unreasonable, or the dignified and the undignified, is in each instance implied. The situation must be a likely situation, *the things said or done being such as normal persons in seriousness occasionally say or do.* Thus

American and Irish humour reflect sober national characteristics, while the humour in Shakespeare has equally its basis in reality. The most absurd "bull" must, therefore, be a possible slip by a sober individual. [*Take jest after jest in comic papers and analyse each, neglecting your general memory.*]

Those who are not morally refined laugh at one who makes a stupid remark. [*Observe.*] They rejoice over the misfortunes of those who are not their friends; and they are glad to see their enemies disconcerted, hurt or defeated. When some one is disappointed, it is to them an occasion for mirth, and they are gratified by the plight in which their adversaries find themselves. This attitude belongs to the serious business of life. In humour proper, on the contrary, we have malice without its sting. [*Is this universally true?*] We still laugh at a stupid remark, at our neighbour's misfortunes, at his disappointment, or his defeat in argument, while we never laugh at their contraries, a wise remark, or a neighbour's good fortune. [*Test this.*] We do not laugh *at* a person; we laugh *with* him; nor do we rejoice over any notable mishap or where our mirth would hurt. [*Test this.*] Nevertheless, the malice is not gone. [*Is this so?*] It still forms the basis of humour; but the stress is transferred from malice to amusement. We train ourselves to the uttermost in detecting unfavourable points, and delight in our discoveries. We spend some of our time inventing good things and retailing them. True humour is distinguished from jubilant malice, as the shadow is from the substance. With this shadow we play.

In the Comic, as such, there is no contemplation. [*Test.*] The wit must burst upon us, and from an unexpected quarter.[*] We must be taken by surprise; for, in proportion as fun develops, so does it fall flat. A *bon mot* should be well told. The attention must be enlisted, the explosion judiciously led up to, and the point unveiled at the psychological moment while its nature is still unsuspected. All humour is explosive, and what is not explosive is not humour. [*Test.*] Hence the beautiful, which invariably depends on contemplation and is never explosive, is widely separated from the humorous. [*Question this.*] Contemplation sometimes leads to humour; but never embodies it. Again, the pleasant mood into which we are thrown by the ludicrous, is mechanically sustained by the momentum produced by the act of explosion. It is not the discovery of characteristics, which impels us to continue amused, but the momentum or the *vis a tergo* alone. Only when the incongruity strikes us like a sledge-hammer—and this may happen repeatedly with the same story—are we amused, and no oftener.

We see clearly that the Comic occupies the attention without requiring a considerable strain, and that it prevents the tedium of aimless rambling as well as the fatigue of effort. Indeed, within limits, it imparts a glow of freshness to the human system on account of its very violence. It is for these reasons that the attention is readily attracted and retained by the humorous, while its limitations are implied in our organic structure. The attention becomes tired of humour, as of everything else, if too prolonged. Humour is most effective where the process of attention is best gratified, as when we are skilfully prepared and preserved in a humorous mood. It depends for its existence on the peculiar nature of our attention mechanism. The humour of a bodiless being is, therefore, to us who are in the body, an amusing conception. Education, habit, false opinions, fallacious reasoning, insistence on or ignoring of certain aspects, the mingling of other factors, our views of right and wrong, must all be allowed for, as was done in our analysis of the beautiful.

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[*] In normal reasoning there are no startling developments, while in the most brilliant reasoning everything is still closely connected. Not so in far-fetched reasoning where the apparent agreement is utterly outweighed by the obvious disagreement, and where the development. therefore, naturally takes us by surprise.

The nature of the Comic has given rise to much discussion. Kant, in his *Kritik der Urtheilskraft*, 1790, §54, defines laughter as that "which results from the sudden transformation of strained expectancy into nothing." Such an explanation misses the whole of the facts; for the surprise is no more a nothing than a beautiful scene which we unexpectedly chance upon, or a stupid reply which has not the merit of causing laughter. In humour, we have to do with a relation of a particular class, and it is the business of science to discover that relation. It has already been shown that a genuinely humorous answer is never haphazard, stupid or meaningless.

Brown examines the nature of the ludicrous in Lecture 58. He holds, without venturing on an illustration, that "we laugh as readily at some brilliant conception of wit, where there are no infirmities of others displayed, as where they are displayed in any awkward blunder" (*Lectures*, 1824, iii, p. 186). In conformity with this he defines the sense of the ludicrous as "the pleasure arising from the discovery of unsuspected resemblance in objects formerly conceived to be known to us, or unsuspected difference in objects formerly regarded as highly similar" (*ibid*, iii, p. 188). It will be seen, therefore, that Brown denies the ever-presence of malice in humour. I feel, however, that the Comic always depends on levelling down, and never appears in levelling up. Unsuspected differences or resemblances, every one must admit, may exist entirely apart from the ludicrous; it is peculiarly the business of the scientist to disclose these. Brown's classification, moreover, of the ludicrous into the burlesque and mock-heroic, the unexpected, the awkward, and bulls or blunders (pp. 197-203) shows that loss of dignity is an essential. Spencer (vol. 3 of *Essays*, "The Physiology of Laughter," first published 1860) has the following Kantian explanation. Our thoughts, he argues, are engaged intently along one line; there follows now an interruption which is not sufficient to occupy the place of that which has engaged us; hence the discharge goes along physical lines. This explanation does not commend itself to me; it seems forced throughout. We need not in humour be engaged intently, and an irrelevant interruption is usually ignored or causes annoyance. Dumont (*La Sensibilité*, 1875) argues that it is the unexpected and contradictory which occasions laughter. He also draws attention to the fact that "we laugh when other people tickle us; but that we do not laugh when we tickle ourselves" (p. 206); and this he would explain by saying that there is no adjustment possible when others tickle us. Yet laughter is by no means an invariable concomitant to tickling, however unexpected, and tickling may be followed by convulsions without laughter. In his *Des Causes du Rire*, 1862, he says: "The Comic may be defined as . . . that which determines our understanding to form simultaneously two contradictory statements" (p. 48). Bain (*Emotions and the Will*, 1875) argues that "the occasion of the ludicrous is the degradation of some person or interest possessing dignity, in circumstances that excite no other strong emotion" (p. 257). Here, also, we may readily imagine a case where there is degradation without the presence of any strong emotion or of the sense of the ludicrous, while the definition scarcely distinguishes between humour and malice. Baldwin (*Feelings and Will*, 1891) claims that "a joke turns on a misplaced grammatical or logical relation which, if properly placed, would have been æsthetic" (p. 242). Lastly, Sully (*Human Mind*, 1892, ii) affirms, as I have done, that "it seems certain that the feeling of glory, or of superiority, is a common ingredient in comic laughter" (p. 150); that "we have in the feeling of the ludicrous a transferred and refined form of the primitive brutal laughter of triumph" (pp. 150-1); and that "the most characteristic form of modern humour occurs where there is a touch of kindly or humane feeling" (p. 152). Mirth presupposes that what surprises us shall not affect us seriously either in body or in reputation; and hence the very same remarks under different conditions appear now as comic and now as tragic. Thus the ambassador who, being intoxicated, fell down before Majesty instead of kneeling, might have caused laughter if the king had been in good humour, or indignation if he had been in an irritable mood. Probably the onlookers were inwardly convulsed with amusement.[1]

246.—THE IMAGINATION.

It is possible to imagine the whole of our thought to be infra-conscious or neural, as part of it is. Deliberation and reflection would then be indicated by a time gulf. We should have immediate knowledge of results; but we should be deprived of active thought in every form. There being no necessity for secondary reflections, the play of thought would, of course, be entirely physical, and hence this section would be left to the neurologist. As the matter stands, the secondary world does not ordinarily lack continuity, nor signs that the central nervous system is busy. A need being given, it is possible that its satisfaction shall be compassed instantaneously. The brain occasionally works thus, and it is imaginable that at some future period the man-machine will generally reach that high level. However, as this is not yet an accomplished fact, we must inquire as to the mode of satisfying a need. The process, we learn, has at least three aspects, and follows the method of cross-classification (sec. 102). [*Is this so?*] *We redevelop what is to the point; we think of what the future has in store; or we analyse the instance before us.* As to the first, when some difficult problem presents itself, we attempt to overcome it by bringing the *past* to our assistance. We consider whether similar incidents have occurred in our life or in another's, so far as our knowledge extends. We recall cases, and dismiss them if they are not pertinent. Thus we let the light of the past illuminate the present and the future.

Again, we may be aware of a problem which we shall be compelled to face in the *future*. What shall we do? We think of what X. will say, what action Y. will take, or how circumstances will shape themselves. We picture to ourselves a variety of situations and consider how we shall modify them by our action. We endeavour to divine all that can possibly happen, so that we may be equal to the occasion. We also consider how we may create conditions favourable to us.

Lastly, we have to deal with the intimate *present*. We do not now wander far and wide, for the notion to be embodied in a piece of work requires repeated attention. We stop again and again for a few moments to consider a problem which requires immediate solution. Or we wish to make ourselves well understood, and proceed deliberately to use more or less explanatory illustrations. When we thus conjure up *the past*, or anticipate *the future*, or move cautiously along in *the present*, we are said to employ the imagination. [*Observe carefully.*]

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[1] On the subject of the Comic, see also Fischer, *Ueber den Witz*, 1889, and Bergson, *Le Rire*, 1900, which has a bibliography of the Comic.

Given serious work-a-day reflection, and we at once learn that under the peculiar circumstances of our attention mechanism, a play of thought is certain to result if the situation be appropriate. What we pursue under the limitations of effort, we willingly do when restraint is thrown to the winds. When purposely summoning up the past, we treat ourselves with monkish severity; the topic in hand brooks no indiscriminate re-developments; and we think only of what serves our end. A time comes, however, when no necessities press upon us. We then wander about at will over the plains of the past. As a child which is bathing in the sea, rushes now this way and now that, shouts and splashes the water, bound by no law of reason or decorum, so we revel in our vivid fancies. Now we laugh in imagination, now we are sad, now we are excited, now we discern a lovely face or a fine character, now we travel abroad or revisit the scenes of our childhood. Our only purpose is to remain in this restful mood, and we use effort only in turning away from what has ceased to be attractive. The series of images is not a firmly connected one, as when re-development serves a serious purpose. We make no desperate effort to re-develop certain things in preference to others. We do not try to curtail the life of a scene, or to dismiss it, because it is wasting our time. Effort of an acute kind is absent. We drift, and delight in drifting. The attention mechanism, *as in all æsthetic activity*, is exploiting for its own ends an activity otherwise seriously employed. It wants to be occupied; but not to be tired or distressed. [*Experimentally test the working of the imagination.*]

The future also we are apt to treat dreamily. It is a relief to cut the conventional moorings—a delight to discard rudder and sail, and leave the boat of life to take care of itself. If we cannot attain to a royal crown, our fancy depicts us as the rulers of the world. If the laurel be tardy in coming, we see in imagination the whole earth bow to our genius. If we are scoffed at, we dream of the sincere repentance of the scoffers. On the other hand, we worry ourselves pitilessly. Perhaps we are dullards after all. Perhaps we deserve contempt. Perhaps we are chasing a phantom. Perhaps we are but weaklings. Or, again, in imagination, we successively walk, run, climb, soar, delve and grope. Pleasant or unpleasant the mood may be; but as long as the thoughts move along readily, and require no marshalling, so long is the attention satisfied.

Once more, our own imagination is assisted by those of others. Our thoughts are perhaps not sufficiently prolific to satisfy our demand, so we sit down and read novels, biography, history and poetry. The treasures which the community in this way offers are so great that many are tempted to effeminately dream away a life-time in a harem of fiction. The imagination, the normal object of which is to assist us in meeting emergencies and in overcoming difficulties, is degraded into a purposeless fancy. Instead of pleasant rest from arduous labour, we indulge in emasculating lassitude. Leisure should be the complement of work; unconnected with work it ceases to be æsthetically gratifying.

In conversation, in artistic endeavour, and in all kinds of amateur undertakings, there is a play of thought. The well shaped sentences which are to assist clearness, are often formed for the pleasure of forming them. The ready response which is to cover our retreat or prepare an attack, is cultivated frequently for its own sake. The weighty pronouncement which is to help on the progress of humanity, is sometimes uttered for the sake of complaisance. Metaphor, necessary in primitive life and useful in modern civilisation, is at times employed without ulterior motive. [*Observe the process in the creation of metaphors.*] As children play at '*school*, so adults play at *life* and *work*. The tools of the pioneers of humanity become our playthings.

The practical imagination, owing to the nature of the attention, gives birth to fancy-winged thought. Every power we develop is, in this manner, expanded into a capacity which is of itself desirable, until our light-born fantasies appear to us in a shaded or sober light. At bottom, they are a continuation of the child's playfulness. Our imagination roams hither and thither, according to the stage of its development. The spaces between the occasions for necessary work must be filled up, and how else can that be done except by continuing in play what we began in earnest? Undoubtedly, too, the very play assists us to a limited extent in keeping the memory fresh and bright and our various capacities in good order; but, if we are prudent, we shall not lay much stress on these secondary advantages. Smooth thought, for such is normal thought play, forms a doubtful preparation for arduous work.

The play of thought in children, which is normally so abundant, finds its explanation in the fact that they are incapable of much effort. With them the play has a valuable side. They live in the present, and absorb the elementary social knowledge of things and their qualities. They learn the nature of the world they will have to face. Hence their indifference to the most perfect doll which, by reason of its perfection, offers so little to the attention, and their preference for a whip or a broom. Hence their contempt of such playthings as crowing cocks, roaring lions, and other perverse mechanisms whose simplicity exasperates them. The attention is a born traveller, and, especially with children, hates to be detained since it has to perform an educational mission in the dark interior.

All that has been said of secondary influences when dealing with visual forms applies here. We define attention-determined thought as *need-satisfying development which, of itself, occupies the attention.*

Playful effort of thought is cultivated in several ways. In such games as chess, neural rain is courted. Similarly many parlour games have a predominantly intellectual character. In the same way, we readily pursue favourite studies, though the neural effort required may be considerable. In all these, and related instances, however, the efforts made possess scarcely any value outside the immediate field of application. Ideal intellectual games, which shall rival field sports, are yet to be invented.

Only space and time have prevented the expansion of this important section into a chapter. It would be interesting, for instance, to analyse the visual imagination. When I attempt to think of a golden mountain, I tend to re-integrate some rugged piece of gold or some sun-lit mountain. I can imagine no golden mountain similar to the ordinary mountains I have seen. So also I cannot think of a man whose face is violet in colour. On the other hand, I can imagine printer's types of all sizes and classes. If I wish to think of a church on a hill with its steeple downward, I succeed after a while, probably by picturing a reflection from a pond or river. With me at least memory largely supplies the imagination, while variety in observation is necessary to give the imagination elasticity to transcend the known. Imagination through the medium of language, where varying combinations are the rule, proceeds readily, and organised reaction has made lingual thought almost free. Nevertheless, if we compare the different kinds of stage plays of the same and of various periods, we shall see how the field even of verbal imagination is very much restricted, and is in general determined socially. [*Some advanced students should make a close study of the nature of the imagination, applying, of course, all the rules mentioned in sec.* 136.] It may be noted in passing that, given all sensations to be fundamentally alike (sec. 189); given a possibility of constructive imagination; given also a single sensation; and imagination could develop the whole world.

247.—PLAY.

It need hardly be said that motor activity is essential to a normal life. Without the aid of the muscles, action would be paralysed, the environment acting on us without our being able to react. Yet it is rare for the complete wants of the muscular system to be satisfied by our ordinary activities, while the child's work consists principally in play. Muscular exercise of a rational kind stands on a different basis from the exercise of the imagination, for in the latter case the useful results are, at best, very limited, while in the former, they are often ideally satisfactory. Motor play emphatically fits us for motor work.

The play of muscle is not based on the same necessity for continued exercise as the play of thought. In motor action we have the alternative of rest for a prolonged period, an alternative which is wanting in thought proper.* Nevertheless, only appropriate and varied employment preserves the physical tone. If we neglect exercise, the muscles grow flabby and dwindle, and if our work only makes demands on a few muscles, these alone are kept in a state of elasticity. So also over-exercise has the unwholesome effects with which we have become acquainted in our study of thought. Muscle play is distinguished in yet another way from thought play. We have seen how uniformly strain is discouraged in the latter case, while we know that physical effort is a salient feature in the former. This is an additional illustration of the organic basis of our nature. Where effort is genial, we greet it with delight; where it is tiring, we recoil. Hence what is pleasant in motor culture is generally shunned in neural culture. Two additional differences moreover must be observed. The muscular system is normally more inured to effort than the neural system. Just as dreams, through the almost entire absence of effort and of the criticisms of others, show least rationality, so the motor system through the presence of effort and the criticisms of others is ready for effective action. Our teachers can insist upon a physical movement; but in the present state of knowledge, they are easily baffled in matters of morals. If we can once bring controllable pressure to bear on men's thinking and moralising, it will become possible to teach strenuous thought and noble aspirations, while considerable effort will then form a part of thought play (ch. 10). Still, we must not forget that unrelieved muscular labour is not pursued for its own sake. The strain must never be very great or prolonged, and there must be variety. Various muscles must be called into action, and the exercises must not be monotonous, for a complex organism has to be satisfied in a complex fashion. If we could benefit a muscle only by prolonged effort, then a set strain alone would gratify us. In motor activity we are never blind to the fact that only what suits the muscle machinery produces the desired result. Personally we may believe that some curious drug which we are taking preserves us in health and strengh; but the spectator who notes the absence of firmly developed muscles smiles in derision. No schoolboy can make his master believe that he is strong when he is not. In the ages to come the distinction between what we believe ourselves to have achieved morally and intellectually, and what we have actually accomplished, will be similarly drawn on objective grounds. Perhaps we shall then be able to trace the precise elements which rivet our attention in the contemplation of a sunset, and we shall then know, not only that system and change are necessary, but the precise constitution of the system, and the whole of the particular change.

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* We have seen, however, that complete muscular inactivity produces almost immediate sleep (sec. 220).

Our definition of attention did not exclude muscular activities. To attend means to perform work, to expend energy, to keep going certain portions of our organism. Attention, in the wider sense, embraces all activities, though the attribute of constant and systematically changing activity, if we exclude such functions as those of the heart, only applies to the central nervous system. This fact, in itself, assures us that the organism varies in the mode of its activities; but not that it varies arbitrarily, or that anything is ever performed without mechanism or without functioning. Muscle play finds its justification in the nature of the organism in general and of the attention mechanism in particular. When our normal bodily activity satisfies the demand for variety, play becomes unnecessary from the utilitarian point of view, yet even then the attention, longing for easy occupation, induces men to take to sport, sometimes even to live, move, and have their being in sport. With the normal individual, whose bodily occupation leaves much to be desired, physical sport, in the shape of cricket, football, rowing or running, is one of the means of simultaneously relieving the attention and exercising the relaxed muscular system. The play of muscles should be defined as *motor activity which, of itself, occupies the attention*, subject, of course, to all the secondary considerations referred to at the end of the sections dealing with visual forms (secs. 237-42).

248.—A Bird's Eye View.

Given discontinuous needs and a continuous attention process and, as we saw, self-determined activity follows. Also, the lines along which that activity develops are as various, we know, as the forms of our thought, while individual differences find their explanation in social development and personal growth. Hence arises our appreciation of forms and sounds, of unity in the life of the intellect and the affections, of humour, and of intellectual and physical play.

However, we can make our outlook more comprehensive. With one bold sweep of thought we may gain a harmonious view—a view unblurred by divisions—of the totality of man's existence. The life of work and the life of play are not then to be looked upon as two unconnected realms which develop independently of each other. Rather must we see in them an organic whole without break and without cross purposes. Both tendencies together, when neither is irrational, blend into one vivid æsthetic picture. The eager pursuit of wealth, the lust for pomp and luxury and domination, the instincts which keep us on the level of the beast and the brute, the selfishness and ignorance which blind and mutilate: all these make life a jarring discord, setting man against man, and self against self. What is more, the evolutionary view which we have adopted, plainly makes for a life with large purposes and a broad horizon, and is opposed to the narrow æsthetic conception which ignores the oneness of work and play. To dally with what is mean, sensual, enervating, selfish, and disconnected with a rational ideal is to make impossible the higher æsthetics which embrace purposive and self-determined activity. From this standpoint one cannot countenance any severance of æsthetics from ethics. The man who craves for intoxicants, for tasty food, for fine raiment and houses; who wears out a life in voluptuous and irresponsible ease, is far from deserving our emulation. What he admires is out of relation to life as a whole, and is, therefore, a discord in life's harmony. A conception of beauty which is true to itself, transfigures our being as such. It does more than justice; for it not only contemplates life, but expands it. Hence the æsthetic ideal will go in harness with the moral ideal. Above all things, it will strip off the ugly vesture in which the body social is clothed, as well as remove the imperfections of the individual. It will cause all the arts to have a serious aspect. It will aim at harmonising and purifying man's inner world. It will shed brightness and joy everywhere. Lastly, it will not develop at the expense of the larger life. In all our æsthetic speculations we must re-member, what we have learnt throughout this work, that life is an organic whole, and that the æsthetic ideal, therefore, must be one in harmony with the most comprehensive ideal which the human mind is able to fashion.

Additional References.—Allen, *The Origin of the Sublime*, 1878; Allen, *The Origin of the Sense of Symmetry*, 1879; Allen, *Æsthetic Evolution in Man*, 1880; Arréat, *L'Esthétique d'après quelques Récents Ouvrages*, 1899; Bain, *Emotions and the Will*,

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CHAPTER XII

SUMMARY

To the brim this phial's filled,
Its quintessence love distilled.

249.—THE TOTALITY OF EXISTENCE REGARDED AS STATIC.

The contents of thought and action, *i.e.*, what is given, are usually classed under such heads as thing, sensation, feeling, desire, volition, action, thought, imagination, dreams and memory, and each of these classes is usually regarded as more or less rigorously separated from every other. A close analysis, however, modifies the prevailing impression; for in searching for the most comprehensive formula, or the simplest view of things, we discover that our element may be taken to be a simplified touch system, and also that every appreciable fact—thing, sensation, feeling, etc.—can be pictured as a more complicated development or aspect of the almost detailless element or atom we set out with. That is to say, the differences between the various classes mentioned are, for the scientist, secondary or partial, and not primary or complete. At the same time we must allow that *our simplified notions do not simplify things*, do not prove that nothing but elements exist; but they only bear witness that a simplified view of what is given, a model view, is possible.

Coming to detail, we may say that even what is simplest is given in a *system*, and that such systems may be divided into present and past, or primary and secondary systems. (1) Starting out from what is simplest, we have vague, undefined systems called elementary sensations or feelings, of which the feelings of touch, of hunger, of pain, of doubt, of effort, of astonishment, afford examples, and the names of which feelings are interpreted by those groups of systems which regularly accompany each of them. Somewhat higher in the scale we meet with what we have called semi-advanced sensations, which embrace the senses of smell and taste. And, highest in order, we have hearing and sight, of which sight is the more complex. These last two sets of systems—sight and hearing—we have called advanced sensations. Any of the above three classes of systems, forming as they do the simplest things given, we call an *Integral*. (2) Next in order of complexity, we have a *Compound*, where several systems are intimately blended, as in the matter of ordinary observation. (3) Then we have a *Complication* where, as in association, otherwise unconnected systems appear uniformly together. (4) Then a *Combination*, which consists of a train of thought or action. (5) Then systems regarded as *exhausted*, such as objects, *e.g.*, a clock, or notions, *e.g.*, loyalty, and systems regarded as *unexhausted*, such as a clock as immediately seen or loyalty as immediately felt. (6) Then a *Connection*, which deals with the lines of development possible in any instance, and is ordinarily called awareness, consciousness, knowledge, belief, doubt, certainty, reasoning and judgment.

The world is given in a coherent series, the abrupt tail-end of which is termed the Present, and every other portion of which, fitting in somewhere, is the Past. On this principle we determine, when necessary, the place of a fact in the total series—whether it be imagination, dreaming, illusion, simple memory, etc.—by noting what develops or forms alongside of it. The secondary series has usually many minor characteristics; a section of it is much poorer in detail, is less defined, lacks a distinct environment, and disappears more easily than the sections of the primary series. To this may be added that the secondary series which, in the first few moments after primary observation, merely rivals the primary series, dwindles gradually until the given system is completely de-developed or forgotten, *i.e.*, can no more be developed, this de-developing process being only preventable by early and repeated re-development. Lastly, in the panorama of action, thought, imagination and dreams, we have an elaboration of primary and secondary integrals.

The totality of existence, considered as stationary or static, is within itself distinguished only by difference in complexity—integral, compound, complicated, combined, connected, and other systems; or sensation, perception, association, train of thought or action, knowledge, all these constituting one series in the final analysis. Hence we do not acknowledge that matter and thought, or body and mind, refer to two mutually exclusive or discontinuous realms, and hence we abandon in psychology such notions as Self and Energy, which presume to account for the known and analysed by systems which are unknown and unanalysed, *i.e.*, by a system within a system. The world as given is neither chaos nor cosmos, neither a disorderly heap of facts nor a symmetrical structure as science presents it; but any of these at different times. The formulations of the understanding are as truly part of the world as is a model of a machine or a reflection in a lake. The very sense apparatus which is to explain what is given, is itself an integral part of what is to be explained, and can, therefore, explain nothing (ch. 8).

250.—THE TOTALITY OF EXISTENCE REGARDED AS DYNAMIC.

As regards changes, the following general statements—to be further defined—commend themselves if we take the human body as the convenient type of things. We are born with certain gradually changing wants, or functional tendencies, and with a mechanism approximately able to re-establish equilibrium. The wants may be divided into personal (such as distinguish each individual), perennial (such as hunger), periodic (such as the child's love of play), peculiar (such as depend on one's particular environment), passing (such as depend on passing circumstances), and political (such as are determined by society, climate, etc.) (sec. 156). These press for satisfaction, and the process of satisfying them is, in one aspect or another, conventionally called action, thought, attention, reasoning, judgment. deliberation, volition, abstraction. and the like. Owing to the limitations of the mechanism, the process is confined within narrow and well marked boundaries, *i.e.*, only a certain quantity of detail is given, no more and no less; whilst awake, systems are developing unceasingly; and topics, like details, tend to be displaced by other topics. For this reason, so soon as a topic is becoming detailless, there develops simultaneously a second and perhaps a third connected or unconnected topic; and in proportion as a topic is comprehensive, so a fraction of it tends to monopolise the whole field of immediate existence. Hence also the quantity which can be done or thought of at any moment, is strictly limited and rigidly defined (ch. 2). The principal conclusion which flows from the state of things pictured here is that a struggle ensues between needs, or tendencies, as a result of which primary or secondary systems of every class are simplified and economised to the uttermost, a process culminating in the almost entire suppression or elimination of every detail which is possibly superfluous and in the simplified scheme of things furnished by science (ch. 3). The nature of the mechanism is responsible for other consequences, *e.g.*, there must be frequent and arduous repetition at defined intervals if a system is to be readily re-developed, thought out, or pre-developed (ch. 5); the crudity of the mechanism excludes individual genius or precocity and proves all great achievements to be social products (ch. 9); owing to the difficulty of closely attending, the highest class of thought is rare, our ordinary thought being poor in quality, while dreams present a chaos which is due to the low tone of the organism during half-sleep (ch. 10); and, lastly, there being a certain best way of satisfying the conditions of the mechanism, we obtain the various forms of æsthetic gratification (ch. 11).

If we turn to the systems as they change, we learn the following (ch. 4). No separated sensations or images are given in any train of thought or combination, there being traceable only a process of development which is incessantly controlled and guided by existing needs. This process terminates quickly in proportion as similar processes had preceded it. That is to say, the present process is only a slightly modified past process, and the substance and form of that process must be, as a whole, given. A motion to and fro of the eye, for instance, will yield what is required; or else any point in a system may be developed along given lines; or lastly, excitement resulting from recency, or moods, inclinations, what is well known, or disturbances, may be the factors in change. Hence while the most untrained mortal may yearn as much as the most highly skilled, to solve some subtle problem, the latter only will succeed, because with him alone the roads to success are constructed and in excellent repair. Needless to add that as a consequence of the organic nature of thought, innumerable tendencies or inclinations develop in the course of life, the growth and simplification of which tendencies remain usually unobserved. However, all primary and secondary processes satisfy some need or needs, and hence systems in a combination or train of thought are neither associated nor do they suggest one another; but the need—the striving for satisfaction—determines the development of any process from moment to moment along the given lines, being always aided by a host of subsidiary needs and by the effects of recency and excitement. All combinations are thus equally need-determined, only differing from one another in the manner of arrangement and the degree of complexity.

In speaking of needs and their satisfaction, and of functional tendencies, we have introduced teleological notions, *i.e.*, notions yet complex and unanalysed. To avoid possible misapprehension, the process summarised above may be briefly described and illustrated as follows: A certain feeling, called that of hunger, develops and persists; then a certain number of changes occur, the end of which changes ordinarily is that the feeling, called that of hunger, disappears. Primary and secondary integral systems are thus all connected with a centre, forming to the view combinations or trains having a certain, recognisable beginning and a certain recognisable ending. The beginning—looked at in the light of the whole process—we call the need; the changes ensuing we call the process of satisfying the need; and the cessation of the feeling marks for the onlooker the point of satisfaction. Most generally stated we may, therefore, say that *in a primary or secondary combination the systems are found to follow a system which persists until certain changes supervene, and that such systems do not follow each other directly.* This means, in other words, that the processes dealt with by psychologists resemble those observable in physiology and not those known in physics.

251.—DISTURBANCES.

When something specially favourable or unfavourable happens, we have, as a consequence, a disturbance of normal process. Under such circumstances attempts are made to ease the strain, as through laughing or crying, or through removing the disturbance. In these cases we speak of pleasure (semi-opposed disturbance) when the disturbance is ultimately beneficial and is fed, and we speak of pain (opposed disturbance) when the disturbance is ultimately harmful and is strenuously resisted. The sole measure of the pleasure-pain is the extent of the disturbance. The accompanying feelings are indifferent in themselves, though in the lowest organisms feelings probably always co-exist with disturbances and disturbances with feelings. Naturally, too, such disturbances are comparatively rare, needs, and not disturbances, being the feeders of action, or the initiators of systematic change (ch. 6).

252.—THE BUSINESS OF PSYCHOLOGY.

From the above we conclude that the business of the psychologist is to inquire into the following facts: (*a*) The nature and the growth of needs; (*b*) the range, (*c*) the effectiveness, (*d*) the liability to deterioration, to (*e*) improvement or to (*f*) breakdown, of the mechanism which is to satisfy the needs; (*g*) the process of satisfying the needs; and (*h*) the distinguishable parts of such process.

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